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HUMAN RELATIONS SERIES

WHAT THE COAL COMMISSION FOUND

An Authoritative Summary by the Staff

EDITED BY
EDWARD EYRE HUNT
F. G. TRYON JOSEPH H. WILLITS

WITH A

FOREWORD

BY
JOHN HAYS HAMMOND

BALTIMORE
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EVERY MAN, WOMAN, AND CHILD IS THE BENEFICIARY OF COAL

GUIDED BY FACTS RATHER THAN RUMORS, BY INFORMATION RATHER THAN PREJUDICE, THE PEOPLE WILL BE ABLE TO EXERCISE WISELY THE POWERS OF THE GOVERNMENT OVER THIS TYPE OF PRIVATE BUSINESS

UNITED STATES COAL COMMISSION

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FOREWORD

Democracy is slowly learning the method of the engineer and the scientist. Particularly it is learning that the first step in that method is the exhaustive collection of all the pertinent facts as a preliminary to the formulation of sound principle and policy.

Both in its creation and in its operation, the United States Coal Commission appointed by President Harding in the Fall of 1922 represents one of the outstanding applications of this method in American governmental experience. Never before in the history of this government has so exhaustive a "fact-finding" been undertaken concerning any industry. In actual existence only eleven months before it automatically expired by law, the Commission placed its first emphasis upon the primary fundamental in the development of a sound public policy concerning the coal industry,—as indeed, it was directed to do by law,—the laying of an adequate foundation in fact. And upon these facts were based the policies recommended by the Commission to the public and to the industry.

Critics of the Commission who say it accomplished nothing consist chiefly of those whose selfish interest makes them resent any courageous and exhaustive statement of the facts; of those who cannot comprehend the unbelievable complexity of this industry, seeing only a labyrinth of facts; of those who may have some easy panacea they would wish to see adopted. *There is no easy panacea for this troubled industry!* The solution of the coal problem can only grow out of a sustained, thoughtful effort over many years by the public, by Congress, by the industry, and by students generally. The work of the Coal Commission must be viewed, first, in the light of the contribution it makes to the intelligence of the succeeding years of effort, and second, by the soundness of the actual policies it recommended for immediate adoption.

A large measure of the success of the work of the Commission was due to the high scientific capacity and the self-sacrificing devotion which the members of the technical staff gave to the work under a pressure for time that meant in many cases, over long periods, a

working week that almost doubled the usual working hours for government employees. By taking the initiative in the publication of this book and by giving their own time without remuneration to the making of the summaries contained in this book, so that the three thousand pages of the studies of the Coal Commission shall be available in simpler form, the technical staff has once again placed the public under obligation to it. It is a pleasure, therefore, to dedicate this book to them.

It is similarly a privilege to record my pleasure at having had the opportunity to be associated with the other members of the Commission,—Thomas R. Marshall, Charles P. Neill, George Otis Smith, Clark Howell, and Edward T. Devine.[1] Men of force and capacity, and with widely differing backgrounds,—they approached the work always from the standpoint of men seeking the highest public interest without fear or favor. And from this approach came unity and a unanimous report.

JOHN HAYS HAMMOND,
Chairman.

[1] Judge Alschuler was appointed but resigned owing to his unwillingness to give up his judicial appointment in order to qualify as a member of the Commission. While he served, he was a most useful member of the Commission.

EDITORIAL NOTE

The first step toward protection of the public interest is a better public understanding of the coal business.

The United States Coal Commission expired by limitation of statute on September 22, 1923. Its active life was eleven months. It employed at one time more than 500 persons. It spent a little less than $600,000.

Its duty, as defined by Congress, was:

> to investigate and ascertain fully the facts and conditions and study the problems and questions relative to the coal industry with a view to and for the purpose of aiding, assisting, and advising Congress in matters of legislation which will insure a supply of this commodity (coal) to the industries and the people generally throughout the country and maintain the uninterrupted flow of commerce among the states, or any legislation which Congress may, after said investigation, deem wise and which, under the Constitution, Congress has the power to enact.

The reports of the Commission cover a wide range of subjects, and when published by Congress they will fill several large printed volumes. They were submitted at various times between January 15 and September 22, 1923, and released to the public on mimeographed sheets, as the Commission had no authority to print. Their great length, their variety, the technical nature of many of them, the delay in their publication, and the general demand for the findings in a brief convenient form—all these things have prompted certain members of the Commission's staff to prepare this summary volume for the public.

To a certain extent the work is anonymous; for while the Commission gave due credit in its reports to those who collaborated in their preparation, only those who drafted the sections here printed can be named in the present volume.

Chapter I, The Coal Problem, is the work of F. G. Tryon, statistical adviser of the Commission, now with the United States Geological Survey.

Chapter II, How Bituminous Coal is Mined and Sold, is by Sydney A. Hale, of the engineering staff of the Commission,

formerly editor of the *Coal Trade Journal,* of New York. In its preparation Mr. Hale has drawn upon his general knowledge of the coal industry rather than upon studies sponsored by the Commission.

Chapter III is devoted to Costs, Prices and Profits. Section 1, Royalties, and Section 2, Costs and Profits of Operators, are the joint work of David L. Wing, consulting economist, of Washington, D. C., who directed the economic investigations of costs of production, investment and profits of operators for the Commission, and of his associate, James E. Black. Section 3, Costs and Profits of Bituminous Wholesalers and Retailers, is by J. W. Adams, now with the Federal Trade Commission, who directed the study of costs, investments and profits of distributors for the Coal Commission..

Chapter IV discusses How the Miners Live. Section 1, The Bituminous Mine Workers and Their Environment, is by Marie L. Obenauer, director of the Industrial Survey and Research Service, of Washington, D. C., who conducted the investigations of the Commission which dealt with living conditions of the mining population. Section 2, Cost of Living and Prices, is by Bertha M. Nienburg, of Washington, D. C., who directed the study of these topics for the Commission Section 3, Accidents and Health, is by Dr. H. Foster Bain, director of the United States Bureau of Mines, whose staff reported on mine safety.

Chapter V covers Miners' Wages, Hours and Earnings. Section 1, Wage Rates, is by W. E. Fisher, Assistant Professor of Industry, University of Pennsylvania, Philadelphia, Pa., who conducted the study of wage rates for the Commission. Section 2, Volume of Employment and Collateral Employment, is by Dr. Horace B. Drury, of the staff of the Institute of Economics, Washington, D. C., who made the study of this topic for the Commission. Section 3, Turnover, is by Anne Bezanson, of the Department of Industrial Research, Wharton School, University of Pennsylvania, Philadelphia, Pa., as is also Section 4, Earnings. Miss Bezanson was in charge of the latter investigation for the Commission. In preparing the summary on Earnings, Miss

Bezanson was assisted by Miriam Hussey and Margaret Schoenfeld. Marjorie Crossingham drafted the charts.

Chapter VI, Causes of Strikes, is the work of Dr. Joseph H. Willits, Professor of Industry, Wharton School, University of Pennsylvania, Philadelphia, Pa. Dr. Willits directed a group of the labor studies for the Commission.

Chapter VII is devoted to Better Service and Less Waste in Mining and Marketing. Section 1, Underground Management, is by Sanford E. Thompson, consulting engineer, of Boston, Mass. Colonel Thompson studied this topic for the Commission. Section 2, Waste of Coal, Fuel Economy, Contract Purchasing and Storage, and Section 3, Relief from Irregular Operation and Overdevelopment, are the work of C. E. Lesher, Assistant to the President of the Pittsburgh Coal Co., Pittsburgh, Pa., and former editor of *Coal Age,* of New York, who directed the engineering studies for the Commission.

Chapter VIII, Better Adjustment of Mining and Transportation, is also by C. E. Lesher.

Chapter IX, Wherein Anthracite Differs from Bituminous Coal, is by Sydney A. Hale.

Chapter X, The Anthracite Miners, is divided into five sections. Section 1, The Anthracite Mine Workers and Their Environment, is by Marie L. Obenauer; Section 2, Income and Disbursements of Anthracite Mine Workers' Families, is by Bertha M. Nienburg; Section 3, Wage Rates, is by W. E. Fisher; Section 4, Volume of Employment, is by Dr. Horace B. Drury; and Section 5, Earnings, is by Anne Bezanson.

Chapter XI, Labor Relations in the Anthracite Industry, is the work of Dr. Joseph H. Willits.

Chapter XII, The Limited Supply; Use of Substitutes, is the work of Raymond A. Walter, consulting engineer, of New York, member of the engineering staff of the Coal Commission.

Chapter XIII, Production Costs and the Distribution of Anthracite, includes Section 1, Cost of Production, by David L. Wing and James E. Black, and Section 2, Distribution of Anthracite, by J. W. Adams.

Chapter XIV, Corporate Organization of the Anthracite Industry, is by David L. Wing.

Chapter XV, What the Coal Commission Recommended, is by the Secretary of the Commission, Edward Eyre Hunt.

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The American Academy of Political and Social Science, of Philadelphia, Pa., has courteously permitted the use of portions of articles on the Commission's work already published in the *Annals*.

The Secretary takes this opportunity to express his appreciation of the privilege of collaborating for a second time with the distinguished members of the Commission and the Staff.

EDWARD EYRE HUNT,
Secretary

The Bookhouse
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August 1, 1924

INTRODUCTION

CHAPTER I

The Coal Problem

Our Coal Problem is how best to supply the American people with heat and power. Other sources of heat and power—natural gas, oil and falling water—may supplement our supply of coal, but they cannot replace it. Already the output of gas has begun to wane. Production of oil cannot long maintain its present rate. Water power, though inexhaustible, can carry but a part of the load now laid upon coal. Barring some revolutionary discovery of science, coal must remain our principal source of warmth and energy.

Coal is, therefore, less a commodity than a service, the service of heat and power. At some not distant day, the engineers promise this service of power will be managed by generating electricity in central stations located near the mines, controlling their own supplies of fuel, and pooling their output in a vast interstate distributing system. In fact, unifying the service of power through interconnecting electric stations is already proceeding at a prodigious rate, and promises to raise new social issues in the control of the large units of capital thus created. The service of heat, the engineers promise, will also be integrated. Already the mining and wholesaling of anthracite are largely concentrated in the hands of a few big corporations. Householders now using raw bituminous coal will receive instead gas and prepared fuels burning without smoke or soot in automatically-controlled furnaces, and made at central fuel stations. More and more the service of heat and power gives signs of becoming ultimately a huge public utility, and in framing any national policy affecting coal it is important to bear in mind the direction in which technical progress is carrying us.

Our present coal economy represents a stage intermediate between the integrated service of the future and the condition of a generation ago. About one-sixth of the coal produced now reaches the ultimate consumer in the form of electricity, gas or by-

product coke, but with few exceptions the plants in which the conversion of the raw coal is made are located not near the mines, but near the centers of consumption. Our prevailing practice is still to haul the raw coal from the mines and deliver it in chunks to the consumer, leaving him to generate his own power or make his own heat on the spot. To do this there have developed three interrelated industries—mining, transportation and marketing.

The workings of our present mechanism of fuel supply are described in the chapters that follow. The story is one of large distances and big numbers.

The coal-mining industry measured by the number of men it employs outranks any single manufacturing business and stands next to transportation and agriculture. One man out of every 45 works underground in the mines.

Mining and transportation are practically one continuous operation, for it does not pay to store at the mine and the coal is dumped directly from the mine into railroad cars. The transportation of some 650,000,000 tons a year from 9,000 commercial mines in 26 States to 90,000 carload-lot buyers in 48 States is in itself a tremendous undertaking. Coal contributes a third of the freight that is handled by the railroads and requires also a widespread system of wholesale marketing. The coal wholesaler does not physically handle coal, but under existing conditions he performs an indispensable service in making connection between the thousands of small operators on the one hand and the even greater number of consumers on the other.

Consumers buying in less than carload lots are dependent on the retailers, who serve not only millions of householders, but many thousands of small factories, utilities, hotels, apartments and the like.

Into the development of this mechanism of fuel supply has gone a great deal of thought and effort by many keen American business men, and in assessing its deficiencies we must not lose sight of its achievements. Our coal industry has given us the cheapest heat and power in the world. Our mines contribute 42 per cent of the world's supply. The output per man per day in the bituminous mines of the United States is three times that of

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THE TRIP

England and Germany, and in the past 30 years the daily output per man has increased by 67 per cent, and probably no other factor has contributed so much to the rise of American industry as cheap and abundant fuel.

As long as coal was cheap and plentiful, the people of the country took this machinery of coal supply as a matter of course. It was only when it broke down that they awoke to the existence of "a coal problem." To the man on the street that problem is not a long-time development of a service of heat and power, but a present-day matter of prices and shortage. In the past seven years there have been six major crises in the supply of coal, three of them affecting bituminous coal and three anthracite. The public has been acutely conscious of the high prices and of a train of unfortunate consequences—deterioration in quality, breakdown of contract relations between buyer and seller, congestion of the railroads, and unsettlement of general business. To the great majority of the people of the country the coal question is simply, "How can we get plenty of coal at the lowest possible price?"

In seeking an answer to the consumer's question it is essential at the outset to distinguish between bituminous coal and anthracite. Both are coal, and between them there exists a certain play of competition, but the industries producing them differ so greatly in economic organization, in their markets and in the customers they serve that a statement concerning one is seldom true of the other. Hence it is necessary to divide the discussion into two parts, and since the bituminous industry is the larger and the more complex, it may well be treated first.

1. BITUMINOUS COAL.

Once awakened to the existence of "a coal problem," the consumer finds that he owes a certain responsibility to the industry itself. The people of the country want cheap coal, but they do not want it at the cost of loss to the operator or privation to the miner.

On second thought the consumer will no doubt consent to broaden his inquiry to read, "How can we get plenty of coal at the lowest price consistent with fair profits for the owners and a decent living for the mine workers?"

Are the owners getting a fair profit? One of our tasks is to inquire whether the owners are in fact receiving a fair profit, or whether their prices can be reduced. The inquiry is not a simple one. To answer it conclusively involves tracing the transactions in mining and distribution all the way back from the retailer, through the wholesaler, the railroad, and the mine operator to the owner of the coal in the ground, who may be collecting a profit in the shape of royalty. The inquiry is complicated by the inadequate accounts and records of many of the companies involved, by interlocking interests between corporations, and by the confusion of opinion as to the proper basis for reckoning profits. Should profit be calculated in terms of return on original cost, or on present market value, or on cost of reproduction less depreciation? Is there evidence of monopoly profit based upon combination in restraint of trade? Shall investment in reserve coal lands not to be mined for many years be considered entitled to income out of the current price of coal? What is the cost of production, the selling price, the margin between cost and price? What do the income and the balance sheets show? These queries indicate the problem before the Commission in the measurement of profits of operators.

The problem was complicated by the great diversity of conditions in the different fields and during different periods. Records of a single year in the unstable bituminous-coal business might be misleading. A five-year examination of costs and a ten-year examination of profits would be necessary to establish the normal. Averages for the entire industry, made up as it is of high-cost and low-cost mines, making correspondingly large and small profits, of prosperous and poverty-stricken fields, of weak and powerful operators would be of little value. Nothing short of an intensive examination of the records of hundreds or thousands of companies would set at rest this initial point as to the reasonableness of the profits of owners. How, actually, the Commission examined cost reports of 1,752 operators, and profit and loss statements of the 300 largest ones, how it assembled and analyzed reports from 424 wholesalers and some hundreds of retailers covering, respectively, their ten- and five-year costs, investments and profits, how its field agents went over the books of still other

wholesalers and retailers is told in Chapter III. To that chapter the reader is referred for an answer to the question, "Have the owners been making fair profits?"

Are the miners getting a decent living? The consumer will also recognize a certain responsibility for the welfare of the miner. We want cheap coal, but we do not want it at a price that will not give, to those who render a fair day's work, a wage and a condition of life such as the country desires for its people. The task here is to measure the economic status of 660,000 men and their families. It begins with the measurements of the daily wage, a subject of great complexity, because 60 per cent of the men in the bituminous industry are paid by a system of piece rates of so much per ton. These rates vary from district to district and from mine to mine. They are complicated by allowances for extra work, "dead work," and for local variations in the thickness or pitch of the bed in which the man is working. The changes in the rates have been uniform in the union fields, but in the non-union fields each mine is more or less a law unto itself, and to make any orderly statement either of the rates of wages or of the changes in the rates is a task requiring long and patient effort. (Chapter V.)

But the rates alone would reveal little of the earnings of the men, unless considered in connection with the amount of employment. Soft-coal mining is well-known to be an intermittent industry. The average time worked by the mines is about 215 days a year. But the average alone is misleading. It must be supplemented by a statement of the range between those mines that work steadily and those that work less than a hundred days a year. Employment one year may be comparatively high and the next year distressingly low. These complications make the study of the volume and irregularity of employment no less difficult than the study of the rates of wages, and equally indispensable in answering the question, "Do the miners receive a fair living?" (Chapter V.)

It is pointed out by the operators in this connection that the miners do not take full advantage of the opportunity to work. This necessitates the study of labor turnover and of absenteeism

among the miners, their extent, and their causes. (Chapter V, pp. 192-3.)

Again it is possible that miners receive employment from other sources when the mines are idle, and the amount of this collateral employment, if any, should be ascertained before any complete statement of miners' earnings can be made.

The real test of the income that miners can make will clearly be what large numbers of men actually earn during a year. So great is the variation in conditions from mine to mine and district to district, that scattered reports from a few mines would not suffice to establish the level of earnings. Rather is it necessary to examine payrolls of many hundreds of mines and to have compiled at great expense the total wages paid during each payroll period of the year to the individual man. By no other means could the annual earning power, especially of the piece workers, be settled beyond dispute. (Chapter V, pp. 201ff.)

Income alone is, of course, but one indication of the standard of living. It must next be matched against cost of living. That cost in the case of miners living in cities and towns frequented by other wage earners is the same as the cost to others of the industrial population. But the typical mine is remote from the cities. In the isolated mining camps of the Appalachians and the Far West food prices are higher and rents lower than in industrial centers. To determine whether one offsets the other, *ex parte* evidence is not conclusive. It is necessary, if the point is to be settled, to visit the mining community, examine the conditions provided for the men, visit the houses, price goods at the stores, ascertain the rents. The conclusions based upon payrolls and store prices ought to be verified by comparison with the actual expenditures of miners' families. It was these considerations that prompted the Commission's field studies of living conditions, cost of living, retail prices, and family incomes and expenditures. (Chapter IV.)

As a background to these field studies the Commission retabulated the original schedules from the census of 1920 for all men who were reported as coal miners, and prepared a detailed analysis of the make-up of the mining population. The statistics of race, age, marital condition, size of family, number of dependents and

wage earners per family, literacy and citizenship are summarized in Chapter IV.

These studies give a definitive picture of the standard of living among coal-mine workers. As a final test of the reasonableness of that standard it should be compared with the standard of wage earners in other occupations and other industries. The Commission was unable to make such comparison, partly because the data for other industries are very scanty. This gap in the record is a serious one.

Causes of shortage. With the facts as to the profits of the owners and the wages and standard of living of the mine workers once known, the public can more clearly appraise the shortages and high prices. Since 1916 there have been three major crises in the supply of bituminous coal and four periods of Federal intervention.

In the first period of scarcity, August, 1916, to March, 1918, there were no great strikes, and the factor immediately limiting the supply was transportation. To quote from the report of the Coal Commission:

> The period . . . was marked by almost continuous complaint of lack of cars at the mines. But the volume of traffic thrown upon the railroads as a result of the war exceeded anything in their previous history and when by the summer of 1916 adequate preparation had been made to handle the traffic all current requirements for coal were met and an unprecedented surplus accumulated in storage.
>
> The second period of runaway prices, November, 1919, to late in 1920, was originally caused by a nation-wide strike of bituminous miners, beginning November 1, 1919. In this case the shortage created by the strike was aggravated by difficulties in transportation, resulting in part from severe weather, and in part from a strike of railway switchmen, and was further intensified by an unprecedented demand for export and by boom times at home.
>
> In the third period of shortage and high prices (April 1, 1922, to early 1923) the primary cause was a nation-wide suspension of mining, involving practically all union men, which closed the anthracite region completely and shut down two-thirds of the capacity of the bituminous fields of the United States and Canada. . . . As before, the effect of the strike was prolonged and intensified by transportation difficulties, complicated this time by the strike of the railway shopmen.[1]

[1] Preliminary report of United States Coal Commission on Bituminous Coal Industry, January 15, 1923.

The shortages have not been due to a lack of coal in the ground. The reserves of bituminous coal in the United States are enormous. More than half the world's known supply lies within the borders of our country.

The shortages have not been due to lack of facilities to mine the coal. The bituminous mines have a capacity far in excess of that necessary to supply the maximum demand.

The shortages have not been caused primarily by profiteering operators or dealers. As shown in Chapter III, very large profits have been made during the periods of shortage, profits that in many instances bore no relation to the cost of production or the service rendered, or the risk incurred. Yet it does not appear from the record that the high prices themselves are the cause of the shortage, but rather that a disturbed condition of the market brought on by a shortage made possible high prices and consequently large profits. Nor is there evidence that the shortage and high prices of bituminous coal are the result of combination in restraint of trade.

The shortages have not been due to a scarcity of labor at the mines (other than strikes and lockouts). Even during the war there were more men in the industry than could be continuously employed, and at the present time there are at least 150,000 more than would be needed if the mines worked full time.

One of the shortages, but only one, was primarily due to transportation, and that one must be set down to the extraordinary conditions of the war. It is true that "car shortage" has been present during the other periods of shortage of coal. It arises in part because the weekly capacity of the railroads to transport coal, though greater than the weekly consumption of the country, is less than the capacity of the mines. Hence, whenever the market is active, the mines demand more cars than the railroads can furnish. During these later crises the railroads could have met the needs of the country had they not been called upon to make up a deficit in supply caused by stoppage of work at the mines.

As shown in Chapter VIII, the carriers probably need more cars or, what is more important, they need increased yard, track and terminal facilities. Their present facilities are sufficient to

care for an active year's business if it is offered in fairly even instalments; they cannot make up overnight the deficit caused by a great strike without an enormous additional investment in equipment that would at other times lie idle.

The direct and primary cause of the last two shortages of bituminous coal has been a general strike or suspension. Not all strikes produce a shortage. The petty strikes that shut down only one mine have no effect on the aggregate supply of coal. Even district strikes, however long-contested, are easily made up for by increased activity in other fields remaining at work. It is a general suspension, strike or lockout closing the union fields as a whole that has been responsible for the last two shortages of bituminous coal. The problem of averting shortages, therefore, resolves itself into the problem of averting national strikes and lockouts. If some way can be found by which the wage agreements between the United Mine Workers and the union operators can be renewed without stoppage of work, the public will get plenty of bituminous coal.

Causes of strikes. Isolating the general strike as the immediate cause of the shortage, and therefore of the disturbed market, the high price, the profiteering and the suffering of the public, is neither to place the blame nor to locate the ultimate cause. Before sitting in judgment on the merits of the controversy, still more before framing any public policy, it is necessary to find the causes that have provoked the strikes or lockouts. The inquiry now leads to the fundamentals of the labor problem. Is the industry adequately organized for the type of collective bargaining that has been attempted? In this overdeveloped industry there is a constant tendency toward overproduction. Can rigid wage contracts signed by operators and men producing 65 per cent of the tonnage and running for two or three years without provision for readjustment be enforced when subject to the competition of non-union shippers at liberty to cut wages or advance them, as the market requires? How can the unequal competition with non-union coal be met without breaking down those very standards which the wage agreement seeks to maintain? How have miners and operators acquitted themselves of their responsibility in col-

lective bargaining? Have the agreements once made been kept, and if not, why not? What are the sources of irritation and friction that render difficult the negotiation of agreements? How can the interest of the public in continuous production of coal be brought to bear upon the negotiations? Is it desirable to set up a "Coal Labor Board" for the compulsory arbitration of disputes? If desirable, is it legally possible?

Intermittent employment as a cause of strikes. To these questions the studies of the Commission's investigators dealing with the problem of labor relations, presented in Chapter VI, give some answer. Briefly, they find no legal way to prohibit strikes or to compel arbitration and acceptance of an award. They declare the responsibility for providing a continuous supply to rest upon the industry itself and stress the necessity of peaceable renewal of wage agreements by negotiation. They discover large opportunities within the present system of collective bargaining, provided both sides will accept the full measure of responsibility which it implies. They recommend public participation through the fullest publicity. Not least important, they recommend removal of the constant irritation of unemployment and intermittent employment. It is clear that the extreme irregularity of employment and the inequalities in amount of employment when some mines operate only 100 days while others, paying the same daily rates, operate 300 days, is a major cause of unrest. So long as such inequalities prevail there exists a stratum of men whose annual earnings are not enough to maintain a reasonable standard. The students of employment, personnel management and labor relations, who reported on the causes of strikes to the Commission, united in recommending that a systematic effort be made to stabilize employment.

Other signs point to irregularity of operation as a fundamental element in the coal problem. The burden of maintaining the excess capacity and the excess labor force is passed ultimately to the consumer in the form of higher production costs and higher prices. How much the burden amounts to cannot be precisely stated. It must be equal to the cost of maintaining in idleness 150,000 men and 200,000,000 tons of mine capacity.

The causes of irregularity of employment as developed in Chap-

ter VII are many. Chief among them are the seasonal character of demand arising from differences in summer and winter consumption, and the sheer overdevelopment of the industry, beyond what even the peak season requires. Seasonal demand, it is shown, can be overcome by storage, and the progress of the technical study of storage now assures that if the economic incentive to store be present, the task can be done. If consumers can be induced to store regularly only as much as they have already stored in anticipation of strikes, the idleness due to seasonal variation in consumption can be eliminated.

But the greater idleness due to overdevelopment cannot be easily overcome. The problem here is to discourage the opening of new mines. Every year old mines are worked out and abandoned. Every year the demand for coal increases. If the opening of new mines could be checked for say ten years, the increase in demand would overtake capacity. How to check or reduce the inflation of development under present competitive conditions is the urgent problem of the industry. Should it, as some have proposed, be controlled by a Federal license, to be granted only when the public interest requires the opening of a new mine? Should it be done by encouraging the industry to integrate itself into larger units, to form co-operative marketing associations, and to limit competition? Should it be left to the process of survival of the fittest in a long period of low prices and intense competition, a period in which railroads and consumers unite to prevent car shortages and in which operators and mine workers unite to prevent strikes?

Better service and less waste. Whatever be the decision of the country on these points, points on which the Commission made recommendations, but not definite recommendations, there remains a large field for constructive effort in improving service and in eliminating competitive waste in the bituminous industry. Modern industry in general is much more wasteful than is generally supposed. The wastes in coal are not the fault of the operator, who is running his business as best he can. He is perfectly aware of most of them, and he is simply following what seem to him the dictates of competition.

The wastes include waste in mining, found by the Coal Commis-

sion's engineers to average 35 per cent of the coal in the ground; waste through opposition of the union to increased use of machinery or even direct limitation of output; waste of the time of the worker and of the capital invested in the mine through lack of co-ordination of underground work; competitive wastes of transportation through needlessly long hauls, cross hauls, refusal of railroads to agree on joint rates, absence of pooling arrangements at yards, terminals, and lake and tidewater docks; waste through too many middlemen, necessary as middlemen are; waste in retailing, shown by the low costs of some retailers as compared with most others; wastes in burning coal, by which small steam plants utilize only a fifth as much of the heat value in the coal as a good central electric station; and, greatest of all, the tremendous waste of capital and man-power in running mines only 200 days when they ought to be running 290 days. Chapter VII takes up some of the constructive tendencies within the industry that give promise at the same time of improving service, steadying employment and reducing these wastes.

Better adjustment of mining and transportation. Chief among the opportunities for improvement in service and reduction in cost appears to be better co-ordination of transportation and mining. The railroads and coal mines are mutually dependent. Because the railroads are the largest consumers of coal, taking 28 per cent of all the bituminous output, and because soft coal alone constitutes more than a fourth of the railroad freight, the problems of mines and railroads are closely interwoven. Irregularity in coal output means serious fluctuations in railroad revenue and excessive irregularity imposes impossible demands on the roads. On the other hand, irregularity in car supply means broken working time at the mines. In recognition of the interdependence of mining and transportation lies perhaps the largest hope for improvement of service and reduction of costs. A change in the system of rating mines for the distribution of coal cars as a means of steadying both transportation and mine operation is discussed in Chapter VII.

2. ANTHRACITE COAL

The anthracite industry presents many striking contrasts to the bituminous coal industry. Whereas the mining of bituminous coal is scattered over 26 States, the mining of anthracite is confined to ten counties in Eastern Pennsylvania. Widespread dissemination of ownership characterizes the bituminous industry; close concentration both of landholding and mining is characteristic of anthracite. Steeply pitching beds and other natural difficulties increase the cost of mining anthracite. The disposition of the fine sizes known as buckwheat, rice and barley, which must be sold at a loss in competition with bituminous coal, constitutes a special problem for the anthracite operator, and the cleaning and preparation of his coal for market is so much more extensive than that of bituminous coal as to justify in part, at least, his claim that his is a manufacturing as well as a mining enterprise. For these reasons the anthracite producers wish to be regarded as a separate industry. (Chapter IX.)

Causes of acute shortages in supply. Anthracite, like bituminous mining, has had periods of acute shortage and high prices, and as in the case of bituminous coal, with one exception, all the periods of acute shortage have been periods of suspensions or strikes at the mines.

The one exception was the period from late 1916 to early 1918, when increased consumption resulting from the war, coinciding with a shortage of bituminous coal, made an unprecedented demand upon the anthracite industry. To that increased demand the operators and mine workers responded to the best of their ability, and the difficulties during that period must be laid to the strain of the war, to an exceptionally severe winter, and to the necessary restrictions of the Fuel Administration on westward transportation, rather than to any deficiencies in the industry itself.

The other periods of great shortage have been directly connected with stoppage of work at the mines. The country will long remember the effects of the great strike of 1902. A shorter suspension in 1912 and a twenty-day "vacation" strike in 1920, in protest against the award of the Anthracite Coal Commission, led

to complaints of scarcity of coal, unreasonable prices and inferior quality.

The effects of the great suspension of 1922, with its high prices, "allotments," and substitute fuels, hung over the market for months. Apprehension over another possible stoppage in September, 1923, and a fortnight's idleness before the new agreement was signed, were long reflected in the high prices of "independent" coal at the mines—prices one or two dollars above the new circular prices of the "railroad companies."

The capacity of the anthracite industry is now so nicely adjusted to the demand that practically full-time operation is needed to produce the winter's supply; a strike of even a few weeks disturbs the market immensely.

A shortage of anthracite is quickly manifest in the wholesale and retail trade. Rising prices, occasional shipments of dirty coal, speculative activity, pyramiding of jobbers' charges, increased margins of profit are the not unnatural consequences of a dislocation in supply, and they tend to make the public forget the indispensable service rendered by the middleman. The nature of that service, in tranquil as well as in disturbed markets, and the costs and profits of distribution are set forth in Chapter XIII. Of peculiar significance is the influence of "premiums" on independent coal at the mines upon the retail price.

The anthracite miners. The anthracite problem, like the bituminous coal problem, is therefore largely a matter of labor relations. To understand it requires first of all intensive study of the conditions of labor in the anthracite region; the make-up of the mining population; the wages, hours, employment and earnings of the miners, and the standards of living that can be maintained with the income available. Studies of this character, paralleling those for the bituminous miners, are found in Chapter X.

An underlying cause of irritation in the anthracite region is the inequality of earnings under the antiquated system of wage rates now in effect. Rates originally fixed by individual bargaining and "frozen" by the award of the Roosevelt Anthracite Strike Commission of 1902, have never been readjusted, but have been advanced by uniform flat or percentage changes ever since. It is

pointed out in Chapter X that the operators and the union through the existing machinery of collective bargaining have means at hand for correcting these inequalities and thereby removing one cause of unrest.

Labor relations in anthracite mining. The external conditions in the anthracite region are all favorable to the negotiation of wage agreements and their successful execution. There is no threat of a non-union field waiting to undercut rates and upset the agreement, such as imperils the success of negotiations in the bituminous fields. The contract is binding upon the entire anthracite industry. Under wise leadership of union and management, the day-to-day administration of these agreements gives opportunity to lay foundations of mutual confidence and goodwill that should go far to prevent the rupture of negotiations when the agreement expires. The Commission had many suggestions to make that it thought would improve relations and prevent friction. (Chapter XI.)

But when the orderly machinery of negotiation breaks down the contest resolves itself into a sheer clash of wills and test of bargaining power. The question ceases to be merely one of union administration or labor management. It involves also the right of the public to intervene and to make its interest in continuous production prevail over the clashing aims of the two parties. The inquiry here leads to a consideration of conciliation, mediation, arbitration with voluntary or with compulsory acceptance of the award, and prohibition of strikes. Is this industry so clearly affected with a public interest and so generally recognized to be a public calling that those who enter it virtually give a pledge of continuous service? If so, it comes within the definition of what the Supreme Court of the United States in the case of the Wolff Packing Company against the Kansas Industrial Court has prescribed as the conditions necessary to justify regulation of wages and prices.[2] For the Court implies that compulsory arbitration with compulsory acceptance of a wage award is equivalent to regulating wages and stands on a parity with regulating the price

[2] Chas. Wolff Packing Company vs. Court of Industrial Relations of the State of Kansas, decided by the U. S. Supreme Court, June 11, 1923.

of the product. Or is mining anthracite simply one of many private businesses? If so, has the Government any power to interfere?

Chronic undersupply of anthracite. While anthracite is subject to sudden interruption of supply through strikes and lockouts, in much the same way as bituminous coal, there exists also a chronic undersupply of anthracite. For ten years there has been practically no increase in the production of the domestic sizes of coal suitable for household use, although in the meantime the population of the territory dependent upon the anthracite region has steadily increased.

The fact of the stationary output is undisputed. The cause, however, is a matter of controversy. Is it due to the physical limitations of colliery capacity which cannot be increased? To the State law requiring a certificate in order to become a contract miner? To the supply of contract miners' laborers, from whom the contract miners are recruited? To exhaustion of the deposits? To a settled policy of the companies? These points are treated in Chapters XII and XIV.

Whatever be the explanation of the stationary output, it raises some practical engineering problems of improvement in service. (Chapter XII.) What can be done to eke out the waning supply of the domestic sizes? Will simplification of sizes help? And may consumption of steam sizes for domestic use be increased? What other substitutes are available? Can competition of substitutes be relied on to check high prices of anthracite?

Reasonableness of anthracite profits. Because of this chronic undersupply the anthracite market has been quick to absorb the tonnage offered in recent years practically at the price named by the shipper. The question of reasonableness of profits therefore assumes here a peculiar importance. It is not merely that profits increase during a period of acute shortage. There is also involved a question as to whether the producers, taking advantage of their natural monopoly, have extracted from the consumer a steady monopoly profit.

The region has a natural monopoly. About this has grown a

close-knit business organization which has from time to time been challenged by the Supreme Court of the United States as in some respects resembling a business monopoly. The facts are familiar to all. Seventy-five per cent of the production is controlled by eight large companies which in turn have been closely affiliated with eight railroads serving the region, and with certain of the wholesaling companies. Through ownership or lease they control 90 per cent of the unmined reserves. Three specific actions by this group of companies have been held by the highest tribunal in the land to be in restraint of trade. The Coal Commission after investigation expressed a doubt that the dissolution of railroad and mining companies ordered by the Court could restore effective competition. Under such conditions the issue before the public becomes, first, whether the peculiar corporate organization of the anthracite industry is rendering good service or not; second, whether its prices are fair. Upon the first point the evidence is clear. Large-scale operation has eliminated competitive waste and stabilized the industry. The big companies can and do hold down the price during periods of acute shortage, and they can and do effectively control the distribution of the limited supplies to those customers with whom they have established relations. The capacity of the large, strongly-financed companies for public service is demonstrated. The point on which the public requires confirmation is the amount of the profits.

The findings of the Commission upon this subject, made after careful study in which accountants examined the books of the companies, are presented in Chapter XIV. Yet the determination of profits is neither simple nor easy. The Courts have as yet laid down no uniform rule for the measurement of value. Shall original cost, cost of reproduction, or present market value be used as a basis for judging the reasonableness of present profits? If present market value, shall a limit be set to future reappraisals and revaluations of property assets, particularly the coal-bearing land, adding more hundreds of millions to the $186,000,000 of identified revaluations reported by the Commission? Are these revaluations to be admitted as "investment," upon which profits must be made? Or, on the other hand, shall the public cease to

concern itself with anthracite prices, trusting that the pressure of the miners for increased wages from within and the pressure of substitute fuels from without will keep the margin of anthracite profits within reasonable limits?

3. NEED OF A NATIONAL POLICY OF FUELS AND POWER

The immediate question of prices and supply thus merges into the long-time question of developing a national service of heat and power. Our average citizen, if he has followed the argument thus far, finds that there is no answer to his question, "How to get plenty of coal at the lowest possible price," that does not involve some limitations on the conduct of capital and labor. Plenty of coal implies continuous service and continuous service involves some surrender of the right of persons in purely private employ or capital in a strictly private business, in the interest of the common welfare. The surrender may take the form of voluntary assumption by the industry of the obligation to serve; failing that, it may take the form of compulsory legislation. Irresponsible exercise of the private rights of either operators or mine workers without regard to the consequences to the public is incompatible with "plenty of coal."

Upon this fundamental fact most discussion of the coal problem is now at least outwardly agreed. But as to what precise form the recognition of the public interest should take there is wide divergence of opinion.

One view, though recognizing the public interest in principle, is disposed to concede no substantial guarantee in fact. It holds that coal is a private business, like any other; that the responsibility of government ends with enforcement of the existing criminal law, and that the country will get more coal and cheaper coal by refraining from all interference in relations between operators and miners, or in the price, quality and supply of the product. This view, held very earnestly and sincerely, not by coal men alone, has recently been strengthened by a parenthetical statement in the Supreme Court's decision in the Kansas Industrial Court case, that:

It has never been supposed, since the adoption of the Constitution, that the business of . . . the mining operator or the miner was clothed with a public interest or that the price of his product or his wages could be fixed by state regulation.[2]

In this view, even compulsory publicity of accounts is a violation of the right of business privacy.

A second view opposes regulation but favors public participation in the affairs of the industry through voluntary co-operation between a government agency, such as the Department of Commerce, and trade organizations of operators, dealers and mine workers. This view stresses improvement of service as the chief aim of public policy. It holds that technical progress, improvement in labor relations, better marketing and more efficient combustion offer a way to stabilize supply and reduce prices and conceives it the duty of government to join in actively promoting these ends. In this view the only effective form of public intervention in disputes within the industry is mediation or timely publicity. In Secretary Herbert Hoover's hands this method has achieved notable success.

A third view, despairing of success in voluntary co-operation alone, favors legislation, yet legislation designed not to regulate prices but to improve service through fostering the development of the industry. This view is prompted by the disorganized condition of bituminous mining, broken up into factions and conflicting interests that have frequently shown themselves incapable of united action. It regards legislation to provide for compulsory fact-finding, for promotive work analogous to that of the Department of Agriculture, and for mediation in labor disputes as essential if the industry is in fact to develop into a unified service of heat and power.

A fourth view emphasizes regulation of prices, profits and the distribution of coal as the best means of protecting the public interest. This view has dominated most of the proposals for State and Federal legislation. It springs very naturally from public resentment over shortages and high prices, but fails to deal with the fundamental elements of instability that have produced the

shortages. It is treating symptoms, "applying first aid," not removing the cause of the disease.

The extreme of public control is represented by *still another view* that favors government ownership or nationalization, if not of the mines, then of the coal in the ground under a system of leasing to private capital.

These five points of view are not mutually exclusive, but they represent five shades of opinion. Choosing between them is difficult, partly because of the doubtful legal points involved. For the law of coal is out of step with the economics of coal. It is essentially the English common law of private property in land. It was developed centuries ago in an agricultural island. It is called upon now to deal with continental reservoirs of heat and energy. The principal cases involving the power of State or Nation to control the fuel supply in time of peace have come before the courts from a tiny group of mines in one corner of the agricultural State of Kansas. Do the common law rules, applied to these small workings, give an adequate interpretation of the place of coal in our national economy?

In an industry as wastefully competitive as bituminous coal mining there is a tendency toward integration. Larger units of production and steadier operation are in the public interest. Can this issue be settled by the simple application of the common law and the anti-trust acts? Should prohibitions against combination be relaxed? If so, under what guarantees against high prices and restraint of trade?

Is the coal industry "affected with a public interest"? May miners and operators be required to accept arbitration? If so, does public interference in the fixing of wages also imply public control of prices? The questions just outlined suggest the uncertainties as to how far, if at all, the sovereign power, whether State or Federal, may go in dealing with the industry without fundamental changes in the law. A like uncertainty attends the division of powers between State and Nation.

In the eye of the law, production and distribution are two separate things. The act of production is held to be within the jurisdiction of the State. The act of wholesale distribution, when it

crosses State lines, is a matter of Federal jurisdiction. Yet the distinction, however sound legally, has but slender justification in fact. The two acts are mutually dependent; neither in fact occurs without the other. The coal business does not thus subdivide itself. Indiana alone ships coal into eleven other States and consumes coal mined in seven other States. Fully 83 per cent of the anthracite shipped, and 75 per cent of the bituminous coal, either moves in interstate commerce or is sold to interstate carriers. In this twilight zone between State and Federal authority, effective legal action is lost. Thus in the coal crisis of 1922, the Federal Government found itself powerless to control intrastate business, but the State and local authorities complained that they were at the mercy of producers and wholesalers in other States. In the development of a service that must be conceived on a national scale, this division of authority between the State and Federal Governments is a serious barrier to action through legal process.

The obstacles to effective legislation have a bearing on the probable choice between the five views on national policy above described. The advocates of legislation will see in these difficulties the justification for a constitutional amendment, if need be, to establish beyond dispute the authority of the Nation to deal with its energy resources. On the other hand, those who favor volunteer co-operation with the industry itself here find the best of practical reasons in support of their views.

Whether the country turns to legislation or to voluntary co-operation with the industry, it is clear that we must think of coal on a national scale. The fuel question goes to the very foundations of national well-being. In the hundred years from the end of the Napoleonic Wars to the outbreak of the World War, the world increased its consumption of mineral fuels a hundredfold. This increase cannot continue, and the task of developing a service of heat and power that will make the most of our remaining resources deserves the most earnest attention. The task is one of long-time planning and development, and the confusion of counsel within the industry, the interstate character of the business, and the overlapping of State and Federal jurisdiction require that it be treated as a national, not a local problem.

From this confusion of opinion and mass of fact, the United States Coal Commission was instructed by the Congress to construct recommendations for Government policy. The Commission sat as a jury, not as a court, and its findings were necessarily laymen's findings, not strict construction of the law. They are summarized in Chapter XV.

PART I—BITUMINOUS

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CHAPTER II

How Coal is Mined and Sold

Certain basic facts are necessary to bear in mind when considering the findings of the Commission. The present chapter discusses the kinds of coal; where the coal fields are located; what the miner does; competitive factors in coal mining; causes of lost time; the United Mine Workers of America; strikes and car shortages; rail and water traffic; the complexities of distribution; the functions of the wholesaler and retailer; stocks of coal; consumption; what happens during a shortage; and finally it reviews the recent periods of shortage and high prices, with an account of the four occasions of Federal interference with the coal industry.

The coal resources of the United States. The coal resources of the United States range from the graphitic beds of Rhode Island to the water-logged lignites of the Northwest. The explanation of the marked differences in physical structure and quantitative chemical formulae of American coals is to be found in the origin of these fuel deposits. The commonly accepted theory of the origin of coal is that it is the decayed and fossilized remains of prehistoric swamp vegetation that was subjected to changes in structure and varying degrees of pressure and compression during the countless years of past geologic ages. The heat-producing elements in coal are pure carbon and volatile hydrocarbons. The incombustible mineral residuum is ash. In some coals, presumably those that were subjected to the greatest pressure, the volatile combustibles were almost eliminated; in others, the percentage of volatiles runs high; in the younger coals (the lignites) much of the moisture remains in the coal as mined, but this moisture evaporates rapidly when the coal is exposed to the air.

Kinds of coal. Inasmuch as there was no uniformity in the internal and external changes through which this prehistoric vegetation passed in the metamorphosis into coal, coal varies in physical structure in different parts of the country and in different beds in the same general locality and in chemical composition, quantitatively speaking, in the same seam in the same mine. Although

these delicate gradations in quality not infrequently become of major importance in the actual sale of fuel under highly competitive conditions, it is obvious that any scientific or commercial classification of coal that attempted to make slight variations in structure or chemical analysis the basis for the establishment of a separate class would degenerate into a meaningless catalog. It is possible, however, to consider these changes in groups and the grouping so arrived at is used to determine the "rank" of coals.

This term designates the differences due to the progressive change from lignite to anthracite. The change is marked by a loss of moisture, oxygen and volatile matter. In classifying coals by rank, the controlling factors are the fixed carbon and the volatile matter. The higher the former, the higher the rank of the coal. On this basis coal is ranked, in descending scale, as follows: Anthracite, semi-anthracite, semi-bituminous, bituminous, sub-bituminous (black lignite) and lignite (brown or woody lignite). Naturally the border lines between the different ranks are not always clear, and rank is not necessarily indicative of the fuel value of the coal from the standpoint of the consumer.

Commercial, or trade, classification of coal rests upon a somewhat different basis. The anthracite mined in northeastern Pennsylvania is universally treated as a separate class, but all the coals of lower rank are commonly lumped together under the general term "bituminous coal." In recent years, it is true, there has been a growing tendency to give greater currency to the more detailed scientific grouping, but unless the rank (e.g., semi-anthracite, semi-bituminous, sub-bituminous) is specifically stated, the term "bituminous coal" covers all ranks below anthracite and it is so used in these pages.[1] Before the World War "semi-bituminous" coal was distinguished from bituminous by the descriptives "smokeless" and "low volatile." Another common designation of the highest grade semi-bituminous coal was "Navy Standard."[2] With the

[1] Unless otherwise qualified, the bituminous coal statistics also include the limited production of true anthracite found in the West.

[2] So called because coals produced by mines in the semi-bituminous region are on what is known as the "Navy Acceptable List," or list of mines from which the Navy Department will purchase coal for bunker fuel under ordinary conditions.

pooling arrangements[3] enforced at the North Atlantic ports during the war, something approaching the fuel ratio classification came into vogue; coals were graded according to the percentage of volatile matter they contained and the highest grade semi-bituminous coal was classified as Pool 1 coal.

Primarily, however, trade classification of coal is a "use" classification. Any coal that may be consumed with fair results in a domestic heating plant is called a domestic coal; any coal that may be used for steam-raising purposes in an industrial plant is called a steam coal. The more exacting requirements of certain industrial processes necessitate further refinements in the steam coal classification, as the coal that will work under the boiler will not always be adapted to specialized uses. As a result, we have gas coals for making coal-gas; bunker coals for steamship use; coking coal; by-product coal, fuel suitable for use in the by-product process of coke-making; cannel coal, not a true bituminous, but a freak coal very rich in gas properties and now used almost, if not exclusively, in open fireplaces; low sulphur coal, which may be gas, ordinary steam or coking coal, although the sulphur content of coal assumes the greatest importance in primary metallurgical work and in coking. Not only the use, but the equipment in which the coal is to be consumed must be taken into account; pool 1 coal is the favorite bunker fuel of the navy, but that coal nearly tied up the railroad terminals at Chicago in 1919 because the switch engines in service there were not equipped to burn that grade efficiently. Another factor that enters into the use classification is the size of the coal.

The coal fields. The coal areas of the United States are grouped into six provinces.[4] The most important is the Eastern

[3] See p. 80.

[4] Campbell defines "coal provinces, regions and districts" as follows:

Coal district is a term applied only to developed coal areas. A district is generally small, and the term is restricted to areas in which mines are developed continuously on a given bed or beds, and the coal is generally known in the trade by some distinguishing feature, such as a trade name, or by some physical characteristic upon which it is advertised and sold.

A coal field is an area of coal-bearing territory next larger than the

coal province, which probably contains 90 per cent of the high-rank coal of the country. It is made up of the anthracite regions of Pennsylvania and Rhode Island; the Atlantic coast region of Virginia and North Carolina and the great Appalachian region. The anthracite regions will be considered elsewhere in this volume. (Chapter IX.) The Atlantic coast region is of little commercial importance at the present time. The Appalachian region, extending from Pennsylvania through Ohio, the Virginias and eastern Kentucky and Tennessee to Alabama, has been called "the greatest storehouse of high-rank coal in the United States, if not in the world. This near-by, almost inexhaustible supply of high-grade fuel has been the foundation of the development of the blast furnaces, the great iron and steel mills, and the countless manufacturing enterprises of the eastern States."[5]

In general, the rank of the coals in this region decreases in an east-west direction, because the more easterly beds felt the full force of the great continental thrust which folded the rocks of the Appalachian trough.[6]

Four distinct regions make up the Interior province, which

district. Its recognition is based less upon trade practices and uses than that of a coal district, and, therefore, it has more of the natural features to characterize it. It is applied to an area generally larger than a district, but still to a well-defined compact area. Coal fields may be grouped into larger divisions called "regions." Such grouping is generally designed to bring together coal fields that have some feature or features in common, thus enabling them to be considered as a whole or separately as the problem may demand. As fields are grouped into "regions," so regions are grouped into much larger divisions called "provinces." The grouping into provinces is made largely for convenience in considering broad questions of geologic age, geologic structure, quality of coal and transportation. In a province, as in a smaller division, there is a certain amount of unity in the physical features of the coal fields of the province or in the quality of the coal. Some provinces contain all ranks of coal, and the fields are grouped together because of their geographic positions, their structural features, or the age of the coal beds.—Campbell, Coal Fields of the United States, p. 10-11.

[5] Campbell, op. cit., p. 11.

[6] Ibid., p. 12.

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includes all the bituminous coal areas near the Great Lakes, in the Mississippi River Valley and in Texas. The most important is the eastern region, in which lie the coal deposits of Illinois, Indiana and western Kentucky. Second in importance is the western region; this region includes Arkansas, Oklahoma, Kansas, Missouri and Iowa. The northern region, lying in the northern part of the southern peninsula of Michigan, and the southwestern region, in Texas, are relatively unimportant at the present time, as very little coal produced in these two States enters the channels of interstate commerce. Generally speaking, the coals of the Interior province have not been subjected to anything like the pressure that contributed to the devolatilization of much of the fuel found in the Appalachian region of the Eastern province; the rank, therefore, is not as high. A notable exception, however, is found in the mining districts of Arkansas and part of Oklahoma, where the coal field is near or part of a mountainous area of uplifted rocks and the beds have been devolatilized to about the same extent as the Appalachian coals. Aside from these Arkansas-Oklahoma beds, however, Interior province coals as a whole are not equal in quality to those mined in the Eastern province, but the wide territory they serve and the rapid growth of industry and population in that territory make the Interior province highly important from the commercial standpoint.

Commercial exploitation of the coal resources of the Gulf province has been confined to a few localities in Texas, where lignite of the same general character as that found in Arkansas, Mississippi and Alabama is mined. The lignites of the three States named are undeveloped because the higher-rank coal in adjacent fields is ample to meet all requirements of the consumers in this area. "The Northern Great Plains province includes all the coal fields in the Great Plains east of the Front Range of the Rocky Mountains."[7] The coal-bearing rocks in this province escaped much of the upheaval that changed the rank of the fuel farther east and farther west. Most of the coal is either lignite or subbituminous; it is only in the basins near the mountains that the rank increases.

[7] Ibid., p. 14.

For variety, the Rocky Mountain province outranks the other five. The coal ranges in rank from anthracite down to lignite, but most of the fuel is either sub-bituminous or low-grade bituminous.

Western Washington is the most important area in the Pacific Coast province. There are small fields in California and Oregon, but little attempt has been made in recent years to continue their development, both because of the inferior quality and because of the competitive pressure of other fuels, notably fuel oil.

In addition to the great diversity in quality and rank and the wide diffusion of the coal deposits of the country, the marketing problem is further complicated by sharp differences in natural mining conditions. There is no uniformity—or anything even approaching it—in the thickness of the coal beds, in the depths at which they lie below the surface or in the pitch or formation of the seams. Coal is mined from pinched out veins measuring 12 to 14 inches in thickness and from mammoth veins measuring 40 to 50 feet. The bulk of the present tonnage comes from beds three to seven feet thick.[8] Probably not over 15 per cent of the total output of the country is mined from beds exceeding eight feet in thickness and it is doubtful if the beds that are more than ten feet thick furnish three per cent of the annual tonnage at the present time.

In the Old World, coal operations are carried on at one mine at a depth of 4,000 feet; there are metal mines in this country where the shafts have been sunk over 5,000 feet. But American coal mining is carried on much nearer the sunlight. The deepest operation is less than 1,000 feet; the average depth of the shafts in the United States is probably about 260 feet and many coal beds lie so close to the surface that, instead of digging into the earth to extract the coal, the surface earth—the overburden—is stripped off by steam shovels.

Since the coal deposits have been subjected to the upheavals and the various other changes that have taken place since the prehistoric vegetation was first buried in silt or water, it is not surprising that the position and the continuity of the different seams

[8] Mineral Resources of the United States, 1917, Pt. II, p. 944.

vary. Some beds are fairly level and unbroken; some lie at a sharp angle or pitch; some have been crushed and folded. Some beds will be thick in portions of the field and pinched out in others. In some seams, as the result of a fault, there will be a sharp break in the bed; the displacement of the two sections of the bed may be only a few inches or it may be thousands of feet. Obviously, in the latter instance no attempt is made to follow the bed beyond the fault; indeed, the section lying in the higher level may be so small that it would not justify intensive commercial exploitation. In many cases one bed is superimposed upon another with an intervening layer or band of other matter, such as slate or clay, between the beds. The separation between the two or more beds may be a matter of a few inches or of hundreds of feet. In some cases impurities, such as niggerheads or sulphur balls, occur as nodules embedded in the coal seam.

A coal mine. The natural conditions determine the type of mine and mining operations employed in the recovery of the coal. Where the bed lies so close to the surface that the overburden may be removed by power shovels, the stripping method is used. After the coal seam has been exposed it is broken down by blasting. While mining by this method is on the increase, the strip pit, both in numbers and in production, is still a relatively minor factor, as less than two per cent of the total annual output of the country is recovered in this manner. In hilly or rolling country, where the coal seams lie above water level, the drift mine is much in favor. In this type of mine a gangway or tunnel is driven into the coal seam from the hillside. The tunnel is horizontal or nearly so. A Government classification (1918) of bituminous coal mines by the character of the opening showed that 3,950 operations out of the 6,750 upon which data were received were drift mines.[9] This type of mine far outnumbered all others in the Appalachian region. Where the opening is driven on a downward incline the mine is a slope mine. Naturally, mines of this type are also numerous in broken country. In the plains areas the shaft mine is the predominating type. When this method of mining is employed a shaft is sunk vertically to the coal seam levels. The Government classi-

[9] Ibid., 1918, Pt. II, p. 1375.

fication, to which reference has been made, listed 1,550 operations as shaft mines, 1,103 as slope and 147 as strip pit mines.

Mining practice and mining development reveal almost endless variations in detail and some marked distinctions in principles. In so far as these practices and variations become pertinent to a non-technical study of the coal problem, they will be considered in subsequent chapters. A fair view of the general background may be had, perhaps, from a brief description of the more salient features of a modern shaft mine development worked on "the room and pillar" plan.

Imagine several hundred acres of level country underlain with a six-foot seam of coal lying 300 feet below the surface. After the existence, the extent, the thickness and the pitch of the bed and the nature of the overlying and the underlying strata have been established by drilling in different parts of the acreage, the owners determine what portion of the acreage may be developed economically through a given opening and the shaft is sunk as near the center of the particular area blocked off as other circumstances, including accessibility to transporation facilities, will permit. With the shaft bottom as a starting point, tunnels called main entryways will eventually be driven through the coal seam to the edges of the area blocked off for development. As the development work advances the main entryways will be paralleled by other tunnels or entries at regular intervals, the number and the intervals depending upon the acreage to be developed and the character of the seam. These entries will be intersected at right angles by side or cross entries, so that a plot of bottom development when fully laid out would look like a city street map. The actual cutting through of the various entryways, however, is not done at once, but under proper management, is carried on ahead of the actual mining of the coal.

What the miner does. When the entries and rooms have been driven their sides will be coal. The "bottom" is the material underlying the coal seam; the "roof" whatever overlies it. It is usually necessary to support the roof not only by the coal pillars, but also by wooden props or timber cribs. When the working is in very thick seams both roof and floor may be coal. In the

thinner beds it is often necessary to cut the roadways partly in the roof or the bottom, so as to make them high enough to allow men and equipment to pass. The wall of unmined coal at the end of an advancing room is called the "working face" or simply the "face." From the cross entries, working places or "rooms" are turned off into the coal and cut back until they reach the next cross entry. Between the rooms "pillars" of coal are left to support the roof. At a later stage the pillars also may be removed and the roof allowed to fall, but in many American districts drawing pillars is not attempted. Under such conditions, half of the coal in the seam may be left underground. Indeed, the average loss in our bituminous mines is 35 per cent, of which 19 per cent is avoidable.

Before the coal in the room can be removed it must be broken down. Two methods are employed. Where the coal is blasted from the solid face, the method is called "shooting from the solid." Under the second method the coal is shot loose or otherwise broken down after a cut has been made in the face.[10] This cut may be made either by hand or by machine. When the cut is made by hand the coal so recovered is classified as hand- or pick-mined. At the present time about 65 per cent of the bituminous coal production is machine-mined. The percentage of hand-mined coal is decreasing and the percentage shot from the solid shows no gain. There is, as a matter of fact, strong opposition to shooting from the solid, both because that method increases the breakage of the coal and because the force of the blast weakens the roof and the pillars and thereby increases the occupational hazards. For this reason the practice is prohibited by law in some of the coal-producing States.

When coal-cutting machines are used, the face of the coal is undercut or sheared. Undercutting, whether by pick or machine, is usually done on the level of the floor of the mine extending laterally the entire face and three to six feet into the material.[11] Shearing is "the vertical side-cutting which, together with holing

[10] Ibid., p. 507.

[11] Fay, A Glossary of the Mining and Mineral Industry, p. 713.

or horizontal undercutting, constitutes the attack upon a face of coal."[12] After the coal has been undercut, shot holes are drilled into the face and the holes filled with an explosive charge which shatters the face. Because the face has already been weakened by undercutting and shearing the necessary explosive force is much less than in shooting from the solid and the danger to the coal and to the mine is not as great.

After the coal has been broken down, the men are supposed to remove any large pieces of slate, rock or other impurities brought down with the charge. The coal is then loaded—usually by hand, but sometimes by machine—into mine cars,[13] which have been pushed or hauled to the room. These cars are placed on the haulage tracks and assembled into trains drawn by animal or mechanical power. The train, or "trip," is hauled to the bottom of the shaft, from which the cars are hoisted and dumped into the top works, known as the "tipple," where the process of preparation and sizing takes place.

Preparation for the market. The coal as it is loaded into the mine car is called mine-run and is a mixture of all sizes from large lumps down to powder. Many industries and some household consumers burn the coal in this state, but competitive influences and special types of combustion equipment have created a demand for a variety of and more uniform sizing. The coal that is not to be loaded from the tipple into railroad cars as run of mine must be sized over screens, and under the best mining practice even the mine-run moves over a traveling belt (picking belt) or a platform (picking table) so that the rock and other visible impurities that escaped the inspection of the underground workers may be removed. If the coal is to be sized it is run over round-hole or bar-screens. The number of screens depends upon the number of sizes made.

At many mines, particularly in Illinois and Indiana, sizing is much more complicated, and under the stress of competitive demand as many as nine sizes are currently made. Until a few years ago the bulk of the coal produced in the Appalachian region

[12] Ibid., p. 607.

[13] Not to be confused with railroad cars.

was marketed as mine-run, three-quarter lump (coal held by a screen with ¾-inch openings) and slack (coal passing through the three-quarter screen), but competition has been leading to greater refinements in sizing. In some cases it has been found that impurities that cannot be removed readily by dry preparation may be largely eliminated by washing.[14]

Before the pick miner or the machine runner and loader go down into the mine in the morning, a fire boss has tested all the working places for weak roofs, rock falls and dangerous accumulations of deadly gases. The miner goes down the shaft in a cage the operation of which is controlled by an engineer. His tools are sharpened at a blacksmith shop in charge of a blacksmith and his helpers. Where mules are used a stable boss and stable boys care for the animals in underground quarters. There are also machine shops, frequently underground as well as on the surface, in charge of machinists and helpers who make repairs to mine equipment. Electricians or wiremen string the wires which carry the current that gives a ghostly illumination to the underground workings and feeds energy to the electric locomotives of the underground haulage system. A motorman runs the locomotive and a trip rider looks after the train. Track layers are busy putting down new track and repairing old. Where the grade is steep a spragger brakes the speed of the mine cars by thrusting a piece of wood—a sprag—between the spokes of the car wheels.

After traveling through the maze of underground tunnels or roadways, often with no other light than that given out by the safety lamp stuck in his cap, on the alert for broken wires or trains that roar suddenly out of the darkness and disappear again into the gloom, and timbers knocked down by a derailed car, the miner reaches his room. There, if he is a pick miner, he will undercut the face, drill his shot holes, pack the explosive, in some cases fire the blast, clean the broken-down coal, load it, push the car

[14] The latest data available show between 15,355,169 tons (in 1921) and 20,595,750 tons (in 1920) washed, with a recovery of approximately 88 per cent merchantable fuel.—Mineral Resources of the United States, 1921, Pt. II, p. 514.

to the entry if mules are not available for the service and look after the track and the props in his room. The machine miner, pitting mechanical strength and equipment against the hand skill of the pick miner, can naturally work much faster. Therefore, the machine runner and his helper, who sometimes also drills the shot holes, usually do nothing but set the machine in place, protecting it where necessary with timbers, and undercut the coal. All the other tasks performed by the pick miner, including timbering, room track-laying, cleaning and loading, fall to the lot of the loaders.[15]

The power plant above ground means the employment of an engineer and fireman. In the tipple are the men in charge of preparing the coal, with a weighboss to supervise the weighing of the contents of the mine cars because the miners are paid by the ton. On the ground are cleaners looking for the occasional piece of rock or slate that escaped the eyes of the underground and tipple men, car trimmers, slate dumpers, who look after the mine cars loaded with refuse, car repairmen and yardmen. Inside the mine at the bottom of the shaft are cagers pushing loaded cars into the cage in which the cars will be hoisted to the tipple, and removing the empties that come down. In some mines pumpmen and pipemen are employed to prevent flooding; there are other mines where it is necessary to sprinkle the roadways to keep down dust and so minimize the chances of dust explosions. Brattice men put up partitions in cross entries to control air currents and force them into the working places. The great fans that keep the mine supplied with fresh air are in charge of a special crew. When the entry that is to be partitioned off by the brattice men must be used for the passage of workers and cars, the brattice contains a door that is opened and shut by a trapper boy.

The United Mine Workers of America. All told there are over 30 crafts employed in coal mining, each performing separate

[15] In some mines there is a further division of labor in the room. In some cases brushers or "rock men" may be employed to take down part of the roof or dig up the floor, pushers to move the cars out to the heading, drillers to drill shot holes and trackmen to lay track to the face.—Lubin, Miners' Wages and the Cost of Coal.

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tasks. Unlike the building trades, for example, where the carpenters have one organization, the plumbers another, the bricklayers a third, and so on down the line, all the mine labor crafts employed at operations that recognize the union are members of the United Mine Workers of America and they act in labor matters as a unit. This organization, an amalgamation of the Knights of Labor and the National Progressive Union,[16] began its career in 1890 with a membership of approximately 20,000 out of the 255,244 mine-workers. In 30 years it had so grown that 509,515[17] out of the 784,621[18] men employed in the coal mines of the United States were on its membership rolls in 1920. Beginning as a bituminous workers' organization, in the early years of the century, under the leadership of the late John Mitchell, it forced the Pennsylvania anthracite operators, then closely bound by a strong community of interests, to admit its power. In the bituminous fields its greatest strength lies in the Central Competitive Field (Illinois, Indiana, Ohio and western Pennsylvania), the Southwestern Interstate Field (Missouri, Kansas, Arkansas, Oklahoma and Texas), Iowa, Michigan, Montana and Wyoming. Outside of the Pittsburgh (western Pennsylvania) district, the union has not been able to gain anything like complete mastery over the great Appalachian coal region. At the present time (1924), as an aftermath of the 1922 general strike, its power in Maryland is badly shattered. Northern West Virginia is the only district in the Virginias in which the organization now exercises any real wage control and even there many operators are running open shop. The Pocahontas field has always been aggressively non-union; the New River field swung into the union column a few years ago, but has now swung out. The Kanawha field has largely broken away from the union and the newer developments in southern West Virginia have main-

[16] Organized as the National Federation of Miners in 1885; name changed in 1887, following abortive attempt at amalgamation with Knights of Labor.—Suffern, Conciliation and Arbitration in the Coal Mining Industry, p. 34.

[17] Includes 71,731 anthracite workers. See also footnote 21.

[18] Includes 145,074 anthracite workers.

tained a hostile front towards union penetration. The operators in the Westmoreland gas field and the Connellsville coking region of Pennsylvania refuse to deal with the United Mine Workers of America. The central Pennsylvania field is part union and part non-union. In Tennessee and eastern Kentucky few of the workers are now members of the union. On the Pacific Coast there is division in Washington.

The unionized areas not part of the Central Competitive Field are known as the outlying districts and wage rates for those districts are based upon and differentially adjusted to those agreed upon for the Central Competitive Field. In those districts in which there is no union organization wages and working conditions are sometimes a matter of individual bargaining, sometimes the outcome of negotiations with company groups or company unions, and not infrequently the ukase of the individual operator or a district association of producers. In the latter case the producer or the association merely posts the scale of wages to be paid; the miner must accept if he wants to work.[19] In fairness to the non-union operator, however, it should be stated that in most cases the non-union wage rates have a relationship to those paid in competing union fields. Where the non-union base rate is lower it is commonly justified by the operator on the ground that the opportunities for steady employment at the non-union mine are greater, making possible higher annual earnings than those realized by the union mine worker.[20]

Strikes and car shortage. Wage rates in the union field are for a definite period of time. Insofar as the wage contracts may be carried out faithfully by both parties to the agreement they give to labor costs the stability the lack of which was so disastrous to operators and miners before the United Mine Workers of America assumed a commanding position. In both the enforcement of the contract once made and in compelling the operators to enter into new agreements at the expiration of the old ones, the union has two powerful weapons—public opinion and the

[19] See Chapter V.
[20] See Chapter V.

strike. For the purposes of administration the union is divided into 27 districts (including three in the anthracite regions of Pennsylvania and two in Canada). These districts [21] in turn are divided into subdistricts and local unions. The locals have their presidents, vice-presidents, secretaries, treasurers and local boards; the subdistricts, which take in the locals within a defined territory, and the districts have similar officials. At the head of the organization are the international president,[22] international vice-president, international secretary-treasurer and the international executive board. In addition to the duties usually performed by a president, the head of the union also appoints the organizers—the men who try to bring the non-union miners into the union fold. So it happens that a local or subdistrict, or even a district, may call a strike that is without the sanction of the international executive board. These local strikes, however, are more irritating and destructive of harmonious relations between the colliery owners and the union than a serious check upon production.

The railroads claim—and the records made in 1923 seem to

[21] The districts and 1920 membership were as follows: District No. 1, Wyoming (Pennsylvania anthracite), 18,599 members; No. 2, Central Pennsylvania, 48,289; No. 5, Pittsburgh (western Pennsylvania), 41,761; No. 6, Ohio, 47,959; No. 7, Lehigh (anthracite), 14,389; No. 8, Brazil block (Indiana), 1,024; No. 9, Schuylkill (anthracite), 38,743; No. 10, Washington, 5,184; No. 11, Indiana (except Brazil block district), 35,452; No. 12, Illinois, 95,480; No. 13, Iowa, 16,143; No. 14, Kansas, 10,563; No. 15, Colorado, 5,520; No. 16, Maryland, 5,091; No. 17, West Virginia (except New River district), 38,102; No. 18, western Canada, 2,383; No. 19, southeastern Kentucky and Tennessee, 21,461; No. 20, Alabama, 11,920; No. 21, Arkansas, Oklahoma and Texas, 14,071; No. 22, Wyoming, 7,615; No. 23, western Kentucky, 7,489; No. 24, Michigan, 72,716; No. 25, Missouri, 7,445; No. 26, Nova Scotia, 12,738; No. 29, New River (West Virginia), 9,687; No. 30, northeastern Kentucky, 34. These figures are from a special statement furnished the Geological Survey by the secretary of the union, and include exonerated members. The average paid-up membership for the fiscal year 1921 was 442,057 and the exonerated membership 73,186.

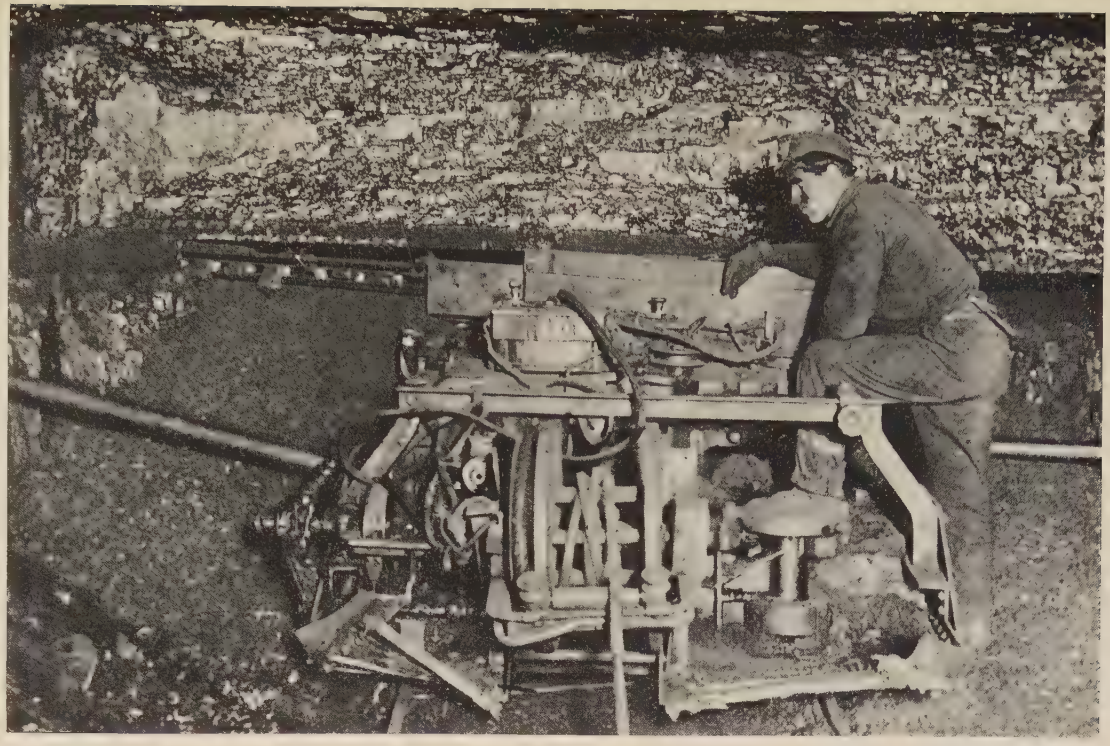
[22] The "international" title is used because the jurisdiction of the union covers the Dominion of Canada as well as the mining fields of the United States.

bear out their statements—that they are able to handle the coal requirements of the country with proper dispatch if the movement is fairly and evenly distributed, but they make no pretense that they have the facilities to handle a 50 per cent overload. As frequently happens, however, if the demand is not evenly distributed, but is concentrated in a few weeks or months of the year, the situation arises where the railroads cannot furnish and handle promptly all the equipment desired. Under such circumstances, transportation disability—loosely spoken of as car shortage—cuts down the operations of mines and replaces "no market" losses as the dominant factor limiting production.[23] The bituminous coal mines of the country have a rated annual capacity of 900,000,000 tons and the maximum output so far attained—in 1918—was 579,386,000 tons, yet four times in the past decade threats of a coal shortage have been so menacing that the Federal Government has stepped in and rationed the supply. As will appear later, country-wide strikes, serious transportation disabilities and extraordinary demand have been the immediate causes of these crises,[24] but they do not wholly or satisfactorily explain the seemingly contradictory facts. The key is to be found in a study of distribution.

Overdevelopment. The two major causes of interference with production and steady running time—"no market" losses and transportation disabilities—spring from the overdevelopment of the mining facilities of the country. Obviously, if the mine capacity of the country is 40 per cent greater than the demand, there must be times when individual mines, entire districts and the mining field as a whole cannot operate because there is no market for their product. When the normal demand is further curtailed by a general business depression "no market" losses will rise as high as 50 per cent of the productive capacity. These losses are probably never wholly absent in some districts, even during periods of

[23] For a quantitative statement of the causes of lost time the reader is referred to the weekly coal production reports issued by the United States Geological Survey.

[24] See Chapter II.



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UNDERCUTTING COAL BY MACHINERY

exceptional demand, but in these latter periods transportation disabilities assume their greatest importance in production records. Unless the coal mined can be brought to the consumer, the fact that the supply in the ground far exceeds the coal resources of any other nation becomes a mockery. The railroads are the principal agencies in transporting the coal from the mine to the consumer. The movement wholly by water from mine to consumer is so small that it may be disregarded. Even in the lake and tidewater trades, to be discussed later, where the quantity annually moved runs into millions of tons, the water transportation is only an intermediate link in a delivery service in which the railroad plays the leading part.

The statements as to rated capacity and excess mines and miners are predicated upon the assumption that production and demand are to be fairly regular, even and constant throughout the year. Stabilization possibly may accomplish this, but if and until it does, the hypothesis employed does not square with the facts. In the past ten years (1914-23) the annual production has varied from 415,921,000 tons in 1921 to 579,386,000 tons in 1918. Monthly production has fallen as low as 16,000,000 tons (April, 1922) and risen as high as 57,200,000 tons (October, 1919). Weekly output has been up to 13,344,000 tons (week ended October 25, 1919) and down to 3,701,000 tons (week ended April 22, 1922.) While the weekly and monthly figures given are exceptional, covering periods immediately preceding a general strike and production when the strike was at its height, they show in a slightly exaggerated form the wide fluctuations to which the bituminous coal trade is subject. The exaggeration, however, merely heightens and does not destroy the picture. "The production of bituminous coal *normally* shows a distinct seasonal rhythm. In the pre-war years there was a marked decline in output in the spring and summer. During the war the seasonal decline was obscured by the abnormal demands of the munitions industries, but in the post-war years it reappeared."[25]

The seasonal rhythm is not peculiar to the bituminous coal industry. It is present in such diverse enterprises as the agricul-

[25] Mineral Resources of the United States, 1921, Pt. II, p. 462.

tural industries, the building trades and clothing manufacture. The railroads, reflecting in their traffic all the ups and downs of the industries that furnish them with tonnage, also know it. What makes the problem acute for both the coal operator and the railroad, however, is their inability to straighten out the curve of movement except as they may be able to persuade their customers to do it for them. Unlike manufacturing enterprises, in which production may be distributed over a long season, although the selling period is a short one, there can be little accumulation of coal and none of transportation at the source for future distribution. Coal storage at the mine is, of course, physically possible, and has been carried on to a very limited extent, but in general it is commercially impracticable.

The causes of overdevelopment, however, go deeper than the seasonal rhythm of the industry. The magnitude of the coal resources of the country has been, and is, a sharp spur to exploitation. The competition created by the opening of new fields has been fostered by the railroad companies eager to increase their coal traffic. Strikes, too, have encouraged the opening of new mines in the districts not controlled by the United Mine Workers of America and many industrial consumers have favored these mines wherever possible as insurance against interruption to a steady flow of coal to their plants. The war also gave mine development a great impetus. In the beginning of the European conflict, rising demand for fuel, coming after months of severe depression in many mining fields, made such heavy drafts upon the Appalachian region for coal to be used in the densely populated manufacturing centers from Pittsburgh east that the western distribution of eastern coal was cut down. Later on the eastern demand reached such proportions that not only was western distribution curtailed, but coal from Illinois was drawn into Ohio, New York and Canada. As prices advanced, abandoned mines were reopened and new mines were developed. This was repeating on a larger scale what had happened on a smaller scale every year that the coal industry had enjoyed prosperity in the past. Still later, after the Federal Government had taken control of the industry, eastern bituminous coal, except for special manufacturing purposes, was

zoned out of western territory and shipments of anthracite were reduced. This naturally increased the demand for western coal and led to further exploitation.

The growth of the consumer-owned, or "captive mine" has also stimulated expansion. Many railroads and large industries now own directly, or through subsidiary corporations, mines that supply all or a part of their fuel requirements. Inasmuch as the captive mines now contribute from 20 to 25 per cent of the total output of the country, their influence is not to be ignored.

Not the least important factor in promoting overdevelopment has been the question of mine ratings. When demand is slack there is no trouble, of course, in getting all the railroad cars a mine can load. But when demand is at its peak the available cars on a railroad or on a division of railroad serving a mining field are prorated according to the mine ratings. These mine ratings have been based upon past performance, but the rules have been so worded that past performance has been judged, not by the total shipments made, but by the capacity as determined by the loadings during the time the mine actually worked during the preceding month. In other words, a mine that ran every working day during the preceding month and produced 2,000 tons per day would have only half the rating of a mine that worked every other day, but produced 4,000 tons per day during the days it was in operation. In times of car shortage, therefore, the second mine would be allotted twice as many cars as the first, although its actual monthly output under normal conditions was the same as the first mine (i. e., 4,000 x 13 days vs. 2,000 x 26). Since times of car shortage have been times of peak demand and peak demand has meant higher prices, the advantage of the higher rating is obvious. It was this system that brought the rated capacity of the bituminous mines of the United States up to 19,000,000 tons a week, although the greatest quantity of coal ever loaded in one week was less than 14,000,000 tons. The subject of mine ratings is now before the Interstate Commerce Commission.[26]

The causes that have contributed to overdevelopment may be traced back to the fierce competition for business that marks the

[26] See Chapter VIII, p. 280.

normal conduct of the bituminous coal industry. While the unparalleled fuel resources of the country have encouraged this competition, the fight for tonnage has been given an acid bitterness by the fact that the coal industry is virtually helpless when it comes to creating a demand for its product. Price may control the placement of the available business, but it has little or no effect in building up new demand. No householder will burn two tons of coal instead of one because the price has been reduced. There is, of course, competition between coal and coal and between coal and gas; in this competition price is important, but this merely changes the kind of fuel, and does not increase fuel consumption.

The situation is further complicated and the competition intensified by the varied character of the industrial demand—revealing, as it often does, sharp changes in the current fuel requirements of different types of commercial activities. Based on records compiled by the United States Fuel Administration, it is estimated that there are approximately 90,000 consumers who buy coal in wholesale quantities—i.e., in carload, barge or boatload lots. The heaviest consumers are the railroads, which use between 25 and 30 per cent of the production. Steel mills and public utilities are also important factors in the coal market. Demand from the steel plants and their affiliated coke ovens fluctuates violently at times. The fuel requirements of the public utilities, on the other hand, exhibit a steadiness matched only by domestic demand. The general apportionment of the production in a year of industrial activity is shown in table 1, compiled from data of the United States Geological Survey for 1920.

To meet these demands there were 12,122 producers operating 14,766 mines. Of this number 1,440 were local country banks, with an average output of less than 300 tons for the year. Mines of this class have no real bearing on the coal problem, representing as they do less than one per cent of the tonnage raised. A second distinct group—the wagon mines shipping by railroad—was made up of 4,405 producers with a mine apiece. The total production from this group was 4,513,800 tons—an average of about 1,025 tons per mine for the year. Unlike the country bank, the wagon mine is a thorn in the flesh of the larger operators. It

has no facilities for tipple loading of railroad cars. Usually the coal is hauled by wagons or motor trucks to consumers in the vicinity of operation, but when general demand is brisk mines of this class will haul coal to railroad sidings for shipment in railroad cars. Loading into cars is much slower than tipple loading, and it follows that the turnover of railroad equipment is much less on cars allotted to wagon mine business than on cars set out at tipple mines.

TABLE 1

Coal consumption by classes of consumers[27]

TYPE OF CONSUMER	NET TONS	PER CENT
Railroads	153,700,000	27.7
Industrials, other than steel and coke	139,100,000	25.1
Steel plants	35,500,000	6.4
Coke:		
Beehive	36,000,000	6.5
By-product	47,740,000	8.7
Public utilities:		
Electric	31,700,000	5.7
Coal gas	4,960,000	0.9
Domestic consumers	57,100,000	10.3
Coal mine fuel	12,100,000	2.2
Exports:		
Canada and Mexico	16,500,000	3.0
Overseas	9,500,000	1.7
Bunker trade (steamship fuel):		
Foreign trade	6,700,000	1.2
Coastwise and inland	3,600,000	0.6
Total	554,200,000	100.0

The rest of the reported output for the year—563,731,972 tons—was produced by 6,277 operators working 8,921 mines an average of 220 days. These figures include the operations of 4,470 producers with 4,774 mines, who averaged less than 50,000 tons per producer and had an aggregate output of 62,128,041 tons. In other words, over 500,000,000 tons came from the 4,147 mines of the 1,807 producers, who raised over 50,000 tons in the year. The

[27] Duncan, Coal Marketing, p. 11.

details of the situation, with respect to the different classes of producers are summarized in table 2.

The following table, it will be noted, is a tonnage grouping by producers—not mines. For example, there were four producers

TABLE 2

Bituminous coal producers by size of output: 1920[27]

PRODUCTION	NUMBER OF PRODUCERS	MINES	TOTAL OUTPUT
			tons
Country banks	1,440	1,440	420,911
Wagon mines shipping by rail	4,405	4,405	4,513,800
Commercial mines producing:			
Less than 2,000 tons	795	798	838,483
2,000 to 4,999 tons	806	814	2,604,260
5,000 to 9,999 tons	748	781	5,337,029
10,000 to 49,999 tons	2,121	2,381	53,348,269
50,000 to 99,999 tons	727	974	51,242,458
100,000 to 199,999 tons	543	888	75,508,562
200,000 to 299,999 tons	202	424	49,019,958
300,000 to 399,999 tons	94	215	32,965,932
400,000 to 499,999 tons	52	152	23,390,433
500,000 to 599,999 tons	33	98	17,914,499
600,000 to 699,999 tons	28	70	18,007,916
700,000 to 799,999 tons	20	122	14,969,468
800,000 to 899,999 tons	12	89	10,112,361
900,000 to 999,999 tons	16	140	14,149,119
1,000,000 to 1,249,999 tons	17	128	18,691,389
1,250,000 to 1,499,999 tons	9	119	12,471,314
1,500,000 to 1,749,999 tons	11	82	17,935,541
1,750,000 to 1,999,999 tons	10	97	18,747,933
2,000,000 to 2,499,999 tons	10	101	20,329,863
2,500,000 to 2,999,999 tons	7	110	21,697,649
3,000,000 to 4,999,999 tons	12	125	43,943,573
5,000,000 tons and over	4	213	40,505,963
Grand total	12,122	14,766	568,666,683

in 1920 who reported an output of 5,000,000 tons, more or less, but these four companies operated 213 mines, with an average output per mine of 191,108 tons. The performance by individual mines, as distinguished from producing units or companies, is shown in table 3.

The classification used in the following table is based upon actual performance, not rated capacity. When demand is easier many mines that could find a market for 200,000 tons or more, fall back into class 2, a number of class 2 mines will slip into class 3, class 3 into class 4 and class 4 into class 5 mines. Many of the class 5 mines will be abandoned. There is, too, a mortality list made up of operations that have been worked out, but these losses are more than offset by the number of new mines brought into

TABLE 3

Number of bituminous mines and production by classes: 1920[28]

CLASS*	MINES		PRODUCTION		PER CENT OF PRODUCTION
	Number	Per cent	Total	Average per mine	
			tons	*tons*	
1	701	4.7	237,467,776	338,756	41.8
2	1,031	7.0	142,750,259	138,458	25.1
3	1,279	8.7	90,668,702	70,660	15.9
4	3,160	21.4	82,129,160	26,012	14.4
5	8,595	58.2	15,650,786	1,821	2.8
Totals.....	14,766	100.0	568,666,683	38,512	100.0

* Class 1 mines are operations producing over 200,000 tons per annum; class 2 mines, 100,000 to 200,000 tons; class 3 mines, 50,000 to 100,000 tons; class 4 mines, 10,000 to 50,000 tons; class 5 mines, less than 10,000 tons per annum.

production. This is shown in a striking manner in the Government classification of mines other than wagon operations and country banks. In 1905 the number was 5,060; in 1910 it had risen to 5,818, to fall in 1913 to 5,776, and rise in 1917 to 6,939. The part the war played in overdevelopment is seen in the figures for the next four years; in 1918 the number of mines jumped to 8,319; in 1919 it was 8,994; in 1920 it was 8,921, and the depression of 1921 pulled the number down to 8,038 mines.

The wholesaler and retailer. In distributing the product of these mines a number of channels of movement are open. The most direct is from the mine to the industrial consumer (including

[28] Mineral Resources of the United States, 1921, Pt. II, p. 522.

the railroads and public utilities) and to the retailer without the intervention of an intermediate agency. This, however, is not always possible. Coal merchandising is a highly competitive business, even under the most favorable conditions, and the smaller mine cannot afford to maintain a sales agency to market its product. It must turn to the wholesaler or jobber. Broadly speaking, the wholesaler may be an independent factor engaged solely in buying outright and reselling for what he can get, he may be another producing company with an established sales department, he may be the *alter ego* of a producer or a group of producers. There are two tests which are applied in the coal trade to determine the status of this intermediate selling agency: 1. Does he physically handle the coal? 2. Does title pass to him at the time the coal is shipped and has he untrammeled say as to the price at which he shall resell it? If the first question can be answered in the negative and the second in the affirmative, then the distributor is a true wholesaler in coal trade terminology. If he sells on a commission basis and cannot fix the resale price, he is not a principal in the transaction, but merely the agent of the producer, even though he may purchase the entire output of a mine on a sales agency contract.

The retail dealer, the coal man with whom the average citizen is most familiar, is an independent contractor who physically rehandles the coal. He has an established place of business, a yard or yards with storage space and equipment, buys in wholesale quantities, unloads the cars or barges delivered and resells the coal received in ton lots or fractions thereof, usually delivering the fuel by truck or wagon to the consumer. He purchases his supply from the mine, the wholesaler and, in the Northwest, from the docks.

The docks scattered along the Great Lakes are both relics of the days when the lakes and the rivers were the principal highways of transportation and the development of the exigencies of the competition and set-up of business in the Northwest. During the summer months great quantities of grain and iron ore move down the lakes and eastern coal offers a heavy tonnage for the return loading. This movement is further encouraged by the railroads

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COAL STORAGE

serving the mines and by the carriers reaching the upper lake docks. The coal moves from the mines in the Appalachian region during the season of the year when general demand and production are at their lowest levels and the natural conditions surrounding railroad transportation the most favorable. The coal can be hauled from the mine assembly yards to the lower lake ports in solid trainloads and dumped rapidly into the vessels over the huge car dumpers. At the upper lake ports it can be loaded out from the docks in cars that have brought in grain to the big elevators there, furnishing a return load for equipment that would otherwise go back to the interior empty.

A minor factor in distribution is the coal peddler—found only in the larger cities.

The channels of distribution described are shown graphically in the chart on page 74.

Consumption. Over 70 per cent of the bituminous coal tonnage consumed is sold upon contracts for periods of six months or more.[29] In a few cases these contracts run five, ten and twenty-five years. Out of a total contract tonnage of 194,972,439 tons, for which figures were available in 1920, the producers sold 82,367,610 tons on sales agency contracts, 13,559,227 tons on output contracts, 17,332,940 tons on requirements and surplus contracts, 79,023,424 tons on definite tonnage contracts and 2,689,238 tons on unclassified contracts. The disposition of this tonnage by consumer types was as shown in table 4, p. 75.

Statistics covering reports from over 1,100 wholesalers in 1920 indicate that these distributing agents sell approximately 75 per cent of the tonnage they handle upon spot or short-term contract (i.e., less than six months) sales. Of the contract tonnage sold by far the greater percentage moved on definite tonnage contracts.

The price of coal. The major item in the cost of production is labor. It might be assumed, therefore, that this, plus other readily ascertainable costs, would constitute an irreducible minimum below which mine prices would not go. That, however, is not always the case. Competition in normal times is so keen that producers

[29] See Chapter VII, pp. 268-70.

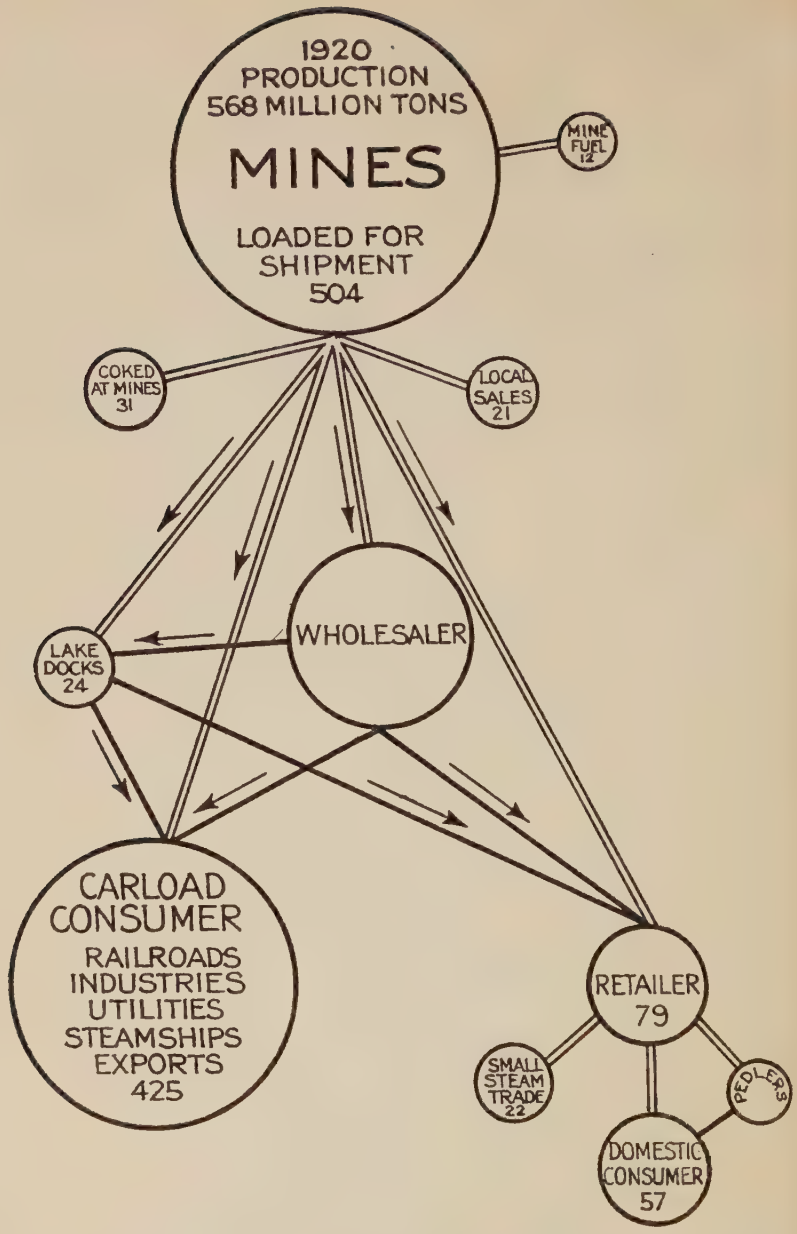


Chart 1. Channels of Bituminous Coal Distribution

The double lines show the channels of direct distribution from the mines; the single lines where an intermediate agency intervenes. (The retailer is not considered an intermediate agency between mine and householder because the latter cannot buy in car-lots.) Figures in circles represent millions net tons in 1920.

are willing to sell substantial quantities of coal at less than the cost of production.

Even when the cost of production is accepted as the irreducible minimum, there are many competitive factors which the producer must take into account in fixing his price. Although the bulk of the coal is sold on an f. o. b. mine basis, the operator cannot ignore the fact that what will influence the consumer is the delivered price. Where two producing districts of the same general character are competing for a common market to which they take different freight rates, the long-rate field will be compelled to shade its mine price to equalize the rates.

TABLE 4

Disposition of coal tonnage by consumer types

CONTRACT	RAILROADS	PUBLIC UTILITIES	RETAILERS	OTHER CONSUMERS	WHOLESALERS
Sales agency					82,367,610
Output	6,526,892	1,875,604	233,693	1,275,212	3,647,826
Requirements or surplus	6,295,909	2,705,031	756,645	6,105,485	1,469,870
Definite tonnage	30,784,418	8,092,128	6,094,140	25,289,019	8,763,719
Others	1,402,428	166,533	7,040	298,070	815,167
Total tons	45,009,647	12,839,296	7,091,518	32,967,786	97,064,192

Volume of tonnage and regularity of movement also enter into price-fixing. Generally speaking, the gross margin exacted by the shipper on sales to retail dealers is higher than on sales to industrial consumers because, where spot transactions in the former may be in one or two car lots, spot sales to the industrial buyer may run into 10, 20 and 50 car orders. The sales effort per ton in the second case is less, so that the seller can afford to work upon a lower margin per ton. For the same reason, under normal conditions, the producer will name a lower price upon contract coal than upon spot coal, taking the average for the latter over the year. A railroad contract, carrying with it the assurance of car supply, has also been considered so attractive by many sellers that prices that have yielded a very thin margin have been made on this class of business. The question of quality is also a factor.

There is then no fixed standard for bituminous coal prices. Attempts have been made from time to time to introduce into bituminous prices something of the stability of "company" domestic anthracite prices, but these attempts have been attended with only partial success.

Complexities of distribution. The predominating movement of coal is westward. Coals from the Appalachian region enter the coal-producing States of the Interior province in substantial quantities and traverse the States west of that province, anthracite even reaching the Pacific Coast region. Coals from the interior and the provinces farther west, on the other hand, seldom penetrate the States to the east of the producing fields in those provinces. Illinois and Indiana coals, for example, cannot normally be marketed east of the Indiana-Ohio State line. The Iowa coals, except an insignificant tonnage, do not cross the Mississippi River. Montana, Wyoming and Colorado coals bridge the Missouri River and move eastward until they are stopped by the westward pressure of Illinois and Indiana fuels. There is some southern movement of Illinois coals, but in recent years little headway has been made in that part of the country against the Appalachian fuels. In the Northwest there is active competition between Illinois and Indiana coals, the eastern coals off the lake docks and Montana and Wyoming production. Except in the Northwest, the Appalachian region has been compelled to surrender the western steam trade to the western producers. This surrender, however, does not extend to the specialty steam market or to the domestic business.

Although most of the bituminous coal produced is sold on quotations f. o. b. mines, the actual marketing is handled through sales offices usually located at or near large centers of consumption. As in the grain trade, a string of primary and secondary markets has been built up to meet the necessities of the industry. The more important primary markets are New York, Philadelphia, Boston, Baltimore, Buffalo, Pittsburgh, Cleveland, Columbus, Cincinnati, Louisville, Indianapolis, Chicago, St. Louis, Omaha, St. Paul and Birmingham.

Taken as a whole, the machinery of distribution that has been

built up is a complicated thing of many delicate adjustments. Despite its ponderous complexities it can function with surprising directness and celerity. The conditions that have thrust "the coal problem" to the front four times in the past decade have, with one exception, arisen out of the competitive and natural factors pictured in the preceding pages. Overdevelopment has encouraged underbuying. Even the ordinary insurance precaution of adequate storage stocks[30] has been ignored by a large number of buyers, although it has been shown that there is almost a mathematical relation between the price of spot coal and the volume of storage coal in the hands of the consumers.[31] So the unexpected shock of a coal crisis probably has been almost as damaging as the crisis itself. That shock has been repeated four times, each time bringing Government interference with the operation of the industry.

The story of these experiments in Federal intervention is the story not of a deliberate venture in public control, but of hastily improvised measures to meet a crisis. On each occasion the nature of the machinery improvised was largely dictated by the powers conferred upon the Executive by the Constitution and the statutes. Under the war powers the control could be direct and far-reaching. In times of peace it could be only indirect and incomplete; indirect, because exercised as an incident to the interstate commerce power, incomplete because it could not deal with production or intrastate commerce. Hence the story of the period is chiefly instructive in showing the disorganization wrought by a crisis in fuel supply, and the ineffectiveness of the Executive's powers to deal with such a crisis.

A brief review of recent periods of shortage and high prices. The World War was directly responsible for the first emergency

[30] Ibid., pp. 265-7.

[31] The relation between the consumer's reserve and the price is almost mathematical. A reserve below 30,000,000 tons indicates a seller's market; 20,000,000 tons indicates a panicky market; and above 40,000,000 tons indicates a buyer's market in which salesmen again take the road and begin to solicit business on the consumer's terms.—Tryon and McKenney, Economic Phases of Coal Storage, American Society of Mechanical Engineers, 1923.

that led to Government intervention. In 1914, bituminous production had dropped to 422,703,970 tons, as compared with 478,435,297 tons the preceding year. The increase in 1915 over 1914 was less than 20,000,000 tons, but in 1916 demand forced the output up to 502,519,682 tons—the first time in the history of the industry that production had reached such a figure. In April, 1917, the Council of National Defense organized a Committee on Coal Production which started out on the theory that, if production could be augmented, prices would take care of themselves. But the country was too impatient to await the working of the law of supply and demand. At the request of Secretary Lane of the Department of the Interior a general conference of bituminous operators was called to meet in Washington on June 26. This conference voluntarily agreed upon a tentative schedule of maximum mine prices that represented substantial reductions from the spot quotations then prevailing in the Appalachian region and advances over current quotations on some of the coals produced in the eastern interior region. The prices so fixed, although repudiated as exorbitant[32] by Newton D. Baker, Secretary of War, in his capacity of chairman of the Council, were generally observed during July and, except in central Pennsylvania and the low volatile districts of West Virginia, in August.

The repudiation of the "Peabody" prices—an action indorsed by Secretary Daniels of the Navy Department—destroyed public confidence in the coal committee and made it necessary to seek some other avenue of regulation. This was found by amending the Lever food control bill then before Congress. The amended

[32] That the "Lane-Peabody prices" were higher than necessary to return the cost of production and a moderately fair profit to the producers has been clearly shown by the subsequent investigation of the committee of engineers of the Fuel Administration. The important point is that the Peabody prices were substantially below those prevailing at that time, that they were from their inception understood to be a temporary stopgap pending a careful determination of more exact and proper prices, and that they were the first and practically the only prices established by an industry as a whole that represented a reduction for the benefit of the public in the history of this war.—Lesher, Prices of Coal and Coke, 1913-1918.

bill became a law on August 10, 1917.[33] Section 1 of the Act declared that the national defense and the successful prosecution of the war required an adequate supply and an equitable distribution of fuel (including fuel oil and natural gas), the prevention of scarcity, monopoly, hoarding, injurious speculation; and the establishment of Government control during the war. The President was authorized "to make such regulations and to issue such orders as are essential effectively to carry out the provisions of this Act."

Price-fixing first claimed attention under the new system of regulation. Maximum mine prices and jobbing commissions on both bituminous coal and anthracite[34] were hurriedly promulgated. In the case of bituminous coal, the cost data upon which the prices authorized were based were admittedly incomplete. Revisions in the light of more detailed information, as well as changes to cover subsequently authorized increases in wage scales, continued throughout this period of regulation, which began August 17, 1917, and ended March 1, 1919. The establishment of maximum retail prices, after an abortive attempt to set up a controlling scale of gross margins, was left to subordinate State and local agencies of the new Fuel Administration. Mine prices were regulated, both directly and indirectly, through a series of orders governing deductions for improperly prepared coal, price differentials on special sized screenings mixtures and mine-run, and surcharges on coal cleaned and screened by special processes, as a result of which "the fuel value of the coal has been substantially increased by the removal of waste and impurities."

Aside from the orders on inspection and special preparation, no formal effort was made to regulate methods of production. In the last months of the war the Fuel Administration sought to increase production per man and per mine by appealing to the individual worker. Local and district production committees were organized, absenteeism was checked and the output kept increasing until the epidemic of influenza hit the mining regions. By the time that scourge had passed the war was over and the necessity for intensified production had disappeared.

[33] Public Law No. 41, 65th Congress. 40 U. S. Stat., 276.

[34] See Chapter IX, pp. 292-3.

The initial efforts at war-time regulation of distribution antedated the Lever law. Early in June, 1918, pooling of coal for the Northwest was started. A few weeks later pooling arrangements at the North Atlantic ports were inaugurated. Under the pooling plan, shipments from the mines to lower lake and tidewater ports were made, not to individual consignees, but to the pool managers. Coal was graded into numbered pools, according to quality and size and shipments made to the pool numbers. The consignor was credited with his shipments to each pool and debited with dumpings over the piers on his orders. The idea back of these pools was the conservation of transportation.

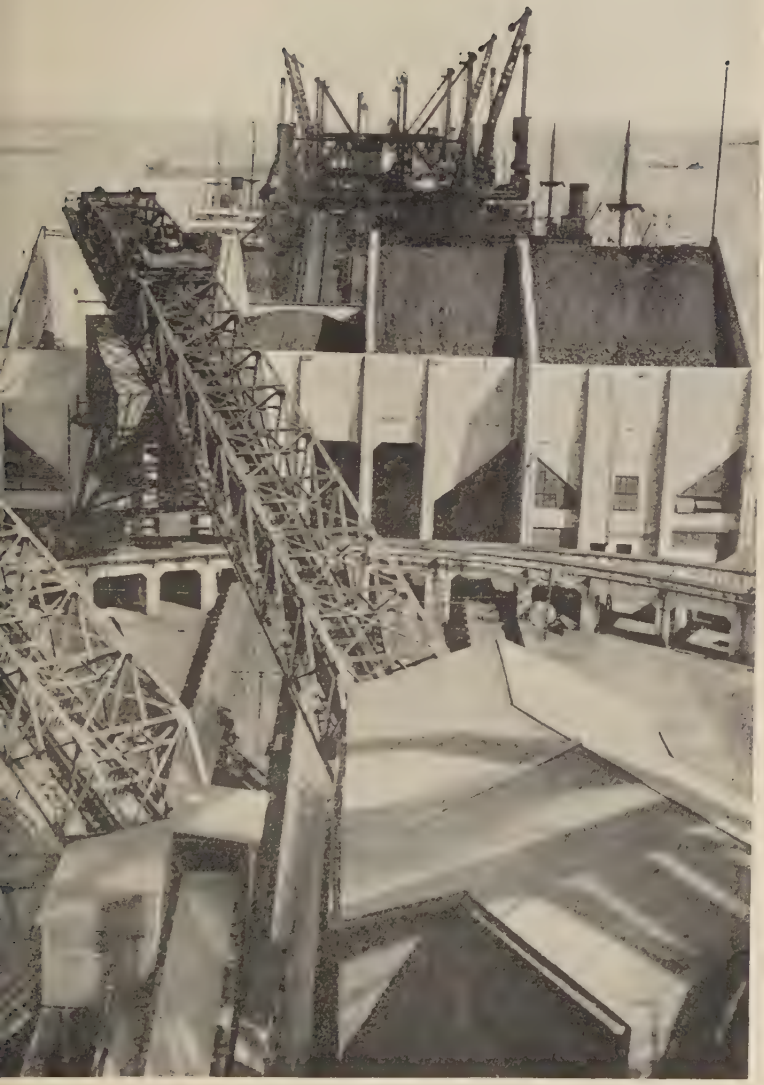
Early in the summer of 1917 the railroads, at the instigation of the War Department, began to give priority to certain coal shipments consigned to manufacturers of war materials. In August the railroads were directed to give priority in the movement of lake cargo coal. In October, acting under the Lever law, the Fuel Administrator ordered all mines served by the Pennsylvania Railroad to sell a portion of their output to that carrier. Later orders were issued to cover the fuel requirements of other carriers.

The most important exercise of control over distribution, however, was the establishment of the zoning system on April 1, 1918. This system divided the coal-producing districts of the country into 13 zones and set out in detail the consuming territories into which each producing zone might ship.[85] The zone orders affected all bituminous coal except railroad fuel, coal moving via inland waterways and coal destined to Canada. A permit bureau was created to issue permits for ex-zone movement to take care of demands for coal for gas, by-product coke making, metallurgical, smithing and other special purposes in consuming zones not allocated to zones mining coals suitable for such purposes.

The zoning system was worked out by the Fuel and Railroad Administrations and was frankly designed to eliminate, as far as practicable, the long distance movement of coal into a consuming area that could get coal from mines closer at hand.

The most dramatic exercise of power under the Lever law was

[85] These orders were modified from time to time and six of the producing zones were subdivided, increasing the number to 22.



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A Coal Pier

the famous Closing Order of January 17, 1918, which shut down "non-essential" industries east of the Mississippi River for five days, beginning January 18, and ordered "heatless" Mondays until March 25. This order was issued at a time of severe weather interference with transportation, when supplies of domestic coal in the retail yards were low, railroad congestion bad, and the situation at tidewater ports particularly menacing to a steady flow of troops and war supplies to Europe.[36] Less spectacular manifestations of this control over consumption included the issuance of orders fixing the maximum storage of stocks that might be held in different parts of the country, limitations upon deliveries to domestic consumers and regulations reducing the consumption of coal by "non-essential" industries.[37]

With the signing of the armistice on November 11, 1918, the conditions that brought Government regulation of the coal industry into being ceased. An Executive order abrogated all outstanding orders of the Fuel Administration except those requiring (a) that all contracts carry provisions making them subject to any later revival of fuel control, (b) that shipments of coal to the Atlantic seaboard for transshipment be made to the Tidewater Coal Exchange, (c) and that all-rail coal move on direct billing. These last two requirements were vacated as of March 1, 1919.

A general strike of union miners, which started November 1 and ended about the middle of December, 1919, was the occasion

[36] Shortage of Coal—Hearings before Subcommittee of Committee on Manufactures, U. S. Senate, 65th Congress, 2nd session, p. 657-674. The "heatless" Mondays were abolished on February 13, 1918.

[37] Between January 9 and April 24, 1918, orders were issued limiting the calendar year coal consumption of florists and manufacturers of building, face and paving brick, paving block, roofing, floor and wall tile, terra cotta, sanitary ware, hollow tile, sewer pipe, drain tile, flue linings, stoneware, and of brewers from 50 to 75 per cent of normal; and of makers of common window glass and cement to a quantity of fuel necessary to manufacture 50 and 75 per cent, respectively, of their normal output. Conservation measures also included the curtailment of street lighting and the use of electric current for advertising signs, the skip-stop system in trolley car operation and propaganda to induce more efficient combustion practices in industries and to hold maximum domestic heating to 68 degrees F.

for the second period of Government regulation. This strike[38] tied up production in nearly every organized bituminous coal field. Three days before the strike began the railroads, acting under orders of the United States Railroad Administration, took possession of all bituminous coal then on wheels in the course of transportation. On October 30 the President issued an order vacating the orders of the United States Fuel Administration promulgated at the close of the first period of control to the extent necessary to restore all rules and regulations concerning the establishment of maximum mine prices on bituminous coal, wholesale commissions and retail gross margins. The next day another Executive order authorized the reestablishment of priorities in accordance with the 1918 preference list,[39] and designated the Director General of Railroads as the President's agent in carrying out his orders.[40] The Director General, by instructions issued November 1, set up a central coal committee with regional and district committees to handle the distribution of the coal that had been seized by the carriers.

Under the system established to cover the distribution of the coal held by the carriers only consumers without reserve stocks could participate in the allotment and then in the order named in the reestablished priority lists. Conservation of stocks on hand was fostered by limitations on coastwise movement, regulations limiting the maximum use of heat, light and power derived from bituminous coal, radical reductions in passenger train service and

[38] The underlying cause of the strike was a demand for increased wages, but the technical cause was a dispute over the date the existing agreement terminated. The agreement, negotiated through the Fuel Administration, was to run until "the end of the war," but not later than March 31, 1920. The union insisted that the failure of Congress to ratify the Versailles treaty could not be used as an excuse to continue the old agreement, notwithstanding the fact that the United States was still technically at war with Germany. The Fuel Administrator supported the operators' contention that the contract did not expire until March, 1920, although he was ready to approve an advance of 14 per cent, which the union rejected. Subsequently John L. Lewis, acting international president of the union, and Attorney General Palmer agreed upon a resumption of work and the appointment of a Presidential commission to pass on wages.

[39] See p. 81, Note 37.

[40] Active control was transferred to the Director General because the organization built up by the Fuel Administration had been disbanded.

curtailment in beehive coke production. Relaxation of some of these restrictions after the strike had ended was followed by renewed activity early in March, 1920, when it was announced that the policy of diverting shipments would be continued to the extent necessary to meet the demands of railroads, utilities, schools, industrials and other important consumers, particularly in New England. These diversions and price control were discontinued April 1, 1920.

When the strike started there were 21,946,000 tons of bituminous coal (including 10,946,585 tons of railway fuel) on wheels. During the strike period, i. e., November 1 to December 13, 1919, there were 24,292,950 tons loaded at the mines.

The third period of Government control actually started before the second had officially ended and lasted until about December 1, 1920. It was primarily caused by the exhaustion of consumers' stocks by the strike of 1919, aggravated by an abnormal post-armistice industrial boom, labor troubles on the railroads and a flood of export coal orders. Industrial consumers, especially those who had lived under the threat that the Government would divert their fuel supply to public utilities and railroads, the preferred classes in the priority lists, were in no mood to repeat that experience on the threshold of a boom demand for their products. Disregarding the advice of the more conservative producers and middlemen, they made haste to cover their requirements as soon as price control was lifted. Unfortunately, the beginning of the new freedom from price control synchronized with an outlaw strike of railroad switchmen at Chicago.

The Federal plan of regulation undertaken during this period involved two distinct phases:

(1) Regulation of distribution, which had an indirect effect upon prices, and

(2) Control of prices through voluntary co-operation between groups within the industry and representatives of the Department of Justice, and through coercive action which took the form of indictments and threats of indictments against shippers demanding prices which the Department of Justice held to be in violation of the anti-profiteering provisions (section 4) of the amended Lever law.[41]

[41] 40 United States Stat., 276.

Control of distribution was placed in the hands of the Interstate Commerce Commission. There were two reasons for this. The Interstate Commerce Commission was the Government agency in closest contact with the railroads and its enlarged powers under the Transportation Act of 1920[42] were construed to give it almost unlimited control over the facilities of transportation and their distribution in times of emergency, with specific authority to establish priorities as between different classes of traffic;[43] while the United States Railroad Administration had become as skeletonized as the Fuel Administration had been a few months earlier when it was displaced by the Railroad Administration because it had no adequate organization to carry on the work of emergency coal supervision.

The first action taken by the Interstate Commerce Commission was an order effective April 16, 1920, restoring the assigned car rules abolished nearly two years before by the Railroad Administration. Under these rules, mines loading railway fuel received a preference in car supply for such loading. About a month later the Commission issued the first of a series of Service Orders designed to unsnarl the general traffic tangle and to give special aid to coal transportation. Lake pools were reestablished and the railroads were directed to give priority to coal moving to the lakes for the Northwest and to tidewater ports.

The orders governing the allocation of open-top equipment included a series giving mines preference in the use of open-top equipment.[44] Except for a month in the fall, these orders applied only to carriers east of the Mississippi River. To promote prompt unloading, the railroads were directed to embargo consignees who did not unload coal within 24 hours after the placement of the car, except where the delay was directly chargeable to the carriers. Late in the summer restrictions on the allocation of open-top cars

[42] Public Law No. 152, 66th Congress. Approved Feb. 28, 1920. 41 U. S. Stat., 456.

[43] Section 1, pars. 15-17.

[44] The original order in this series was to be effective for 30 days and covered all open-top equipment; subsequent extensions excepted low-side cars (36 to 42 inches), cars equipped with coke racks and cars that had been retired from coal service prior to June 20, 1920.

to wagon mines were put into effect. A blanket order giving preference in loading to the current requirements *only* of all public utilities, ice plants, water and sewer plants, hospitals, schools and other public institutions was issued in July. In September this preference was continued, but additional safeguards were thrown around the assignment of cars under the provision of the order. On October 1 preference and priority on coal consigned to the navy from a number of mines in Pennsylvania and Maryland were authorized.

Local representatives of the Department of Justice were instructed to seek the co-operation of groups of coal men in voluntary price control. Where such co-operation was withheld, indictments under the Lever law were sought, and generally procured. This campaign which, as subsequently developed,[45] was without legal foundation, probably induced some slight restraint upon advancing prices, but the powerful corrective agent was the collapse of the industrial boom, which came in the fall of 1920, about the time that the railroads had succeeded in triumphing over many of the major difficulties in operation that had confronted them earlier in the year.

Control during the third period of Government intervention had been far less effective than during the first and second. The war-time power to fix prices under the Lever Act could not well be exercised a year and a half after the armistice, and even the anti-profiteering features of that law had been declared unconstitutional. Persuasion and voluntary co-operation were now the only means to influence prices available to the Government.

Like the second, the fourth experiment in Government control, made in 1922, was the direct result of a general strike of union mine workers. The strike, however, was more serious than that in 1919, since it involved the anthracite miners as well as the workers in most of the organized bituminous coal fields[46] and

[45] United States v. L. Cohen Grocery Co., 255 U. S. Rep., 522 (decided February 28, 1921).

[46] The New River field of West Virginia had slipped back into the non-union column prior to the strike; western Kentucky was not involved and there were some defections from union ranks in the Fairmont and

lasted much longer. The soft coal workers were out from the first of April to the middle of August; the hard coal miners did not resume work until September 11. As offsets to the greater severity of the 1922 strike in men and duration were the facts that it started at the time of the year when actual consumption is at a low ebb and that the dangers of the walkout were known far enough in advance to permit forehanded consumers to accumulate as large, if not larger, reserve stocks as at any previous period in the history of the country. So well fortified did the consumer feel that during the early stages of the strike the non-union mines did not begin to work up to the limit of their capacity, as measured by existing mine development, labor supply and transportation, simply because the market would not take the output. Later on, when the prolongation of the strike and the disaffection of railroad shopmen made serious inroads into reserve stocks, home production was augmented by substantial importations of British coal.

When spot quotations in the non-union fields began to advance sharply towards the end of April, Herbert Hoover, Secretary of Commerce, sought the co-operation of the producers in an effort at price control. A plan of action was devised and submitted to a general conference of operators on May 31, 1922. Under this plan each district then operating was called upon to appoint a committee to advise with the Secretary as to supply, costs, prices and other developments in the respective fields. Acting upon such recommendations, Mr. Hoover fixed maximum spot prices which operators, individually,[47] were asked to accept. The basis of the prices, it was announced, would be the old Fuel Administration scales, modified in the light of changed conditions. The Hoover prices, in nearly every instance, were materially higher than the Fuel Administration maxima. This was justified both on the ground of changed conditions and by the fact that the Hoover

Kanawha districts of West Virginia. These losses, however, were more than offset by unexpected union gains in the non-union strongholds in the Connellsville and central Pennsylvania districts.

[47] To avoid any suggestion of agreement between the operators that might be construed as price-fixing contrary to the Sherman anti-trust law.

scale applied only to free (spot) coal. At the time these prices were named approximately 70 per cent of the non-union production was under contract—most of it at prices considerably less than the new maxima. No specific action was taken with respect to wholesalers' commissions. The retailers pledged their cooperation in opposing speculative resales and in refusing to deal with shippers who ignored the Hoover price formula.

The Hoover campaign had a beneficial effect upon spot prices, which suffered a marked decline in June. The first of July, however, the distribution situation was further upset by a strike of railroad shopmen. This strike delayed repairs to equipment and, to some extent, crippled transportation service, which had been excellent during the first ten weeks of the coal strike. Spot quotations again swung upward. The Government, which had failed in all its mediatory gestures to end the coal strike, thereupon decided that the time had come to tighten control over prices and to take a hand in distribution.

To accomplish these ends it created a Presidential fuel committee and invoked the powers of the Interstate Commerce Commission. The former organization, officially known as the President's Fuel Distribution Committee, was headed by Mr. Hoover. The office of Federal Fuel Distributor, then without statutory warrant, was created for the emergency. Subordinate to the President's Fuel Distribution Committee were an Administrative Committee of coal men, railroad officers and Government officials, each member in charge of a special phase of distribution, viz: (1) railroad fuel, (2) tidewater coal, (3) New England and general eastern distribution, (4) lake coal, (5) southwestern distribution, (6) southeastern distribution, and (7) orders; with district committees and Governors' committees appointed by the State executives to report on consumption, priority needs, distribute emergency supplies and prevent interstate hoarding and profiteering.

The Interstate Commerce Commission, which, according to an opinion rendered by Attorney General Daugherty, was empowered to check "profiteering" by ordering the railroads to refuse cars to mines that exceeded the Hoover maxima,[48] as in 1920

[48] See final report of Wadleigh as Fuel Distributor for Interstate Commerce Commission action.

resorted to Service Orders to control distribution. Carriers were again directed to disregard shippers' routing when such action would expedite movement; preferences and priority in transportation to a number of commodities, including coal and coke, and preferential distribution of open-top equipment to mines were ordered. Failure to unload promptly was again penalized by embargoes. A new system of priorities in coal loading at the mines was inaugurated.[49] To take care of the Northwest the Presidential committee ordered certain producing districts to ship their output three days a week to the lakes. Class 1 priorities were issued for the movement of coal to a number of railroads and public utilities in the Middle West and to stop the competitive bidding for railroad fuel, which threatened to demoralize the price situation. The end of the bituminous coal strike late in August was soon followed by a relaxation in restrictions.

Throughout the strike period, regulation, other than that exercised by the Interstate Commerce Commission, had been effective solely through the voluntary co-operation of the coal industry. There were many who questioned the legality, not only of this voluntary control, but of some of the things done by the Interstate Commerce Commission. To remove these doubts Congress enacted the Cummins-Winslow embargo law,[50] effective September 23, 1922, declaring the existence of a national emergency in the production and distribution of coal, specifically enlarging the powers of the Interstate Commerce Commission to include the issuance of embargoes and such other steps as might be necessary "to secure equitable distribution" and "to prevent . . . the purchase or sale of coal or other fuel at prices unjustly or unreason-

[49] The five classes were: (1) Such purposes as specifically designated from time to time by the Interstate Commerce Commission; (2) Fuel for railroads, bunkering, public utilities, national, state and local government departments and institutions, hospitals, schools, etc.; (3) Coal for lake loading; (4) Commercial sizes of coal available for domestic use, and (5) Coal for other purposes.

[50] Public Law No. 348, 67th Congress. Approved Sept. 22, 1922. 42 U. S. Stat. 1025.

ably high." The law also created the office of Federal Fuel Distributor.

Four coal crises in less than a decade had convinced many people that there must be something basically wrong with the industry. There were some who favored drastic action, but the more conservative believed that an impartial examination of all available facts should be made before any national policy with respect to coal should be adopted. The conservative view prevailed and on September 22, 1922, Congress passed the Borah bill,[51] providing for the creation of a Federal fact-finding agency known as the United States Coal Commission. The studies made under the direction of the Commission furnish the data upon which the chapters which follow have been based.

[51] Public Law No. 347, 67th Congress. Approved Sept. 22, 1922; amended by No. 499, 67th Congress. Approved March 4, 1923. 42 U. S. Stat. 1023, 1446.

CHAPTER III

Costs, Prices and Profits

To determine if the owners have been making fair profits, the Commission examined a series of transactions in mining and distribution, including the profits of the land owners in the shape of royalties, and the costs, investments, and profits of mine operators, wholesalers and retailers.

1. ROYALTIES

The Commission was directed to inquire into the "Ownership and titles of the mines." This covers not only the developed mine workings, but also the coal reserves or lands which contain the unmined coal. The operator may hold title in fee-simple to the land, including both the surface and the underlying coal; he may own the coal but not the surface land; or it may be that he owns neither, but simply has the right from the owner to take the coal from the land on payment of a charge called a "Royalty." While this arrangement is often termed a "Leasehold," and the owner of the land is called a "Landlord," it should be noted that such a lease is not the same as that usual between landlord and tenant. The royalty is not payment for the *use* of the landlord's property. The transaction is in essence one of partial payment, the owner selling a portion of his property which the purchaser must detach and remove from the premises.

An extensive inquiry was made by the Coal Commission into the ownership of coal lands, both those owned in fee by the operators and those leased under a royalty arrangement. The pressure of other work, however, made it impossible to compile and analyze the results before the expiration of the life of the Commission, though some use was made of it in furnishing the basis for an estimate of the total value of the coal lands in the country prepared for the Commission by a special committee of engineers. Much raw material for comprehensive study of the

amount and the nature of ownership of the coal lands already exists, therefore, in the files of the Coal Commission. In its present state it cannot be used to throw light on the subject.

In the bituminous coal industry the operators own in fee-simple most of the coal on the lands from which they mine. There are a large number of operators who mine some coal on a royalty basis, but as a general rule in most fields coal mined from leaseholds forms a small part of the total output. That means that the ownership of bituminous coal lands is widely distributed among 4,000 or more operators, each of whom has an output of over 10,000 tons a year and who produced about 98.5 per cent of the country's output in 1920. In the bituminous coal industry there are *relatively* few instances of the ownership by operators of coal lands which are far in excess of what is necessary to protect their present investment in developed coal mines. This wide-spread ownership of bituminous coal lands is primarily due to the fact that coal is being mined in over 80 fields, in 24 States, and that large areas of land on which coal is thought to exist are awaiting the development of transportation facilities.

While any general concentration in ownership of bituminous coal lands is not practical under present conditions, there are a few fields which form exceptions to the general rule. In the Pocahontas field in West Virginia, for example, there is a very great concentration in ownership of the coal lands.[1] This field

[1] The statements made in regard to concentration of land ownership in the Pocahontas field are based on the following sources:

(a) Interstate Commerce Commission.
  (1) Case No. 940 Pocahontas Coal and Coke Co. v. Norfolk and Western Ry. Co., et al.
  (2) "Statement of investment of Class 1 Steam Railroads in securities of coal companies, December 31, 1921. From annual reports to the Interstate Commerce Commission."

(b) Pocahontas Operators' Association.
  (1) "Concerning Pocahontas Coal," issued May 1, 1921.
  (2) "Annual Shipments from Pocahontas Flat Top Field," issued 1923.

(c) Poor's Manuals, Railroads and Industrials, 1923.

(d) Moody's Analyses of Investments, 1923.

was discovered in 1873, and reached its period of largest output in 1916, when about 20,000,000 net tons were produced and shipped as coal or coke. The coal in this field is of a high grade, of the type known as "smokeless," is in good demand, and has ready access to market over adequate transportation facilities. Most of the 50 operators in this field in 1920 paid royalty to one of the principal landowning companies there, the Pocahontas Coal and Coke Company and the Crozer Land Association. Of the total output shipped from this field in 1920 more than 95 per cent was produced from lands owned by one or the other of these two companies. The Pocahontas Coal and Coke Company is much the larger land-holder. It owns or controls about 300,000 acres of coal land, of which about 178,000 are now under lease to the various operating companies. Most of this land lies in West Virginia, but some of it is in the Pocahontas field across the State line in Virginia. According to its 1921 annual report to the Interstate Commerce Commission, the Norfolk and Western Railway owns all of the stock of the Pocahontas Coal and Coke Company.

There are several operating companies in the United States which own or control large areas of coal lands, not only in one but in several fields. While such companies are relatively few as compared with the total number of coal operators, the aggregate of their land holdings and of their output forms an important fraction of the total. Three of the principal companies of this type are the U. S. Steel Corporation (and subsidiaries), the Consolidation Coal Company (and subsidiaries), and the Pittsburgh Coal Company (and subsidiaries).[2] The U. S. Steel Corporation through its subsidiary companies owned or controlled at the beginning of 1923 about 750,000 acres of coal lands in the States of Pennsylvania, West Virginia, Ohio, Kentucky, Tennessee, Alabama, Indiana and Illinois. The coal deposits on about 685,000 acres were owned by them in fee and about 65,000 acres

[2] The statements made in regard to the coal land holdings of the U. S. Steel Corporation, the Consolidation Coal Company, and the Pittsburgh Coal Company, and their subsidiaries, are derived from testimony given before the Senate Committee on Manufactures (1921), and from Poor's Manual for 1923 and Moody's Analyses of Investments for 1923.

more were held through leasehold. The surface of about 300,000 acres (included in the foregoing fee-owned acreage) was also owned. In 1920, a year of great industrial activity, the total output was about 30,829,000 tons of coal mined by these subsidiaries and in 1921, a year of industrial depression, it was 21,628,000 tons. The Consolidation Coal Company, in its own name or through subsidiaries, owned or controlled at the beginning of 1923 about 340,000 acres of coal lands in the States of Pennsylvania, Maryland, West Virginia and Kentucky. Of this acreage the coal deposits were held in fee ownership on about 314,000 acres, and, through leasehold, on 26,000 acres. Surface lands owned included in the foregoing acreage amounted to about 6,000 acres. The total production of the Consolidation interests was about 7,915,000 tons in 1920, and 7,741,000 tons in 1921. The Pittsburgh Coal Company and its subsidiaries owned or controlled at the beginning of 1923 about 165,000 acres of coal lands in Pennsylvania, Ohio and Kentucky. Of this acreage about 164,000 acres were owned in fee and 600 acres on leasehold. The surface of the unmined land owned amounted to 19,000 acres. The total production in 1920 was about 12,349,000 tons and in 1921 about 8,262,000 tons.

The yield of coal per acre may vary widely even in the same seam and field. It is of interest, however, to note that Mr. Hornberger, Vice-President of the Pittsburgh Coal Company, testified before a Senate Committee in 1921 that a production of 24,000,000 tons in 1913 by that company exhausted about 3,200 acres of coal land, and a production of 12,000,000 in 1920 exhausted from 1,600 to 1,700 acres. This would indicate an average for this company's holdings of from 7,250 to 7,500 tons per acre. According to a statement in Poor's Manual for 1923, about 100,000 acres owned by the Consolidation Coal Company in the Elkhorn Kentucky field has deposits of mineable coal estimated at 900,000,000 tons. This would average, therefore, 9,000 tons per acre.

Of the 4,000 operators who produce 10,000 tons and over a year, about 200 produced over 500,000 tons per year. Their output formed 47 per cent of the total production in 1920. Many

of these operators have large reserves of coal lands. But what proportion their lands form of the total coal deposits available under present conditions of mining cannot be determined with reasonable accuracy from information at present available.

2. COSTS AND PROFITS OF OPERATORS

Costs. The costs of mining coal and preparing it for market fall under three principal subdivisions,[3] the amounts paid for labor, for supplies and for general expenses—the principal items under general expense being the amounts paid for administration, for taxes other than income and excess profits, for insurance of various kinds, for payments of royalty (in the case of coal mined from leaseholds), or for depletion and depreciation charges. The depletion charges are amounts by which the removal of the coal decreases the value of the investment in the coal land in the case of lands owned in fee. The depreciation charges are the amounts sufficient to equalize the decreasing value of the investment, because of the wearing out or deterioration of the equipment.

There is a wide range of costs even in the same field. Most of the important differences of costs in mines in the *same field* can be attributed to differences between the physical conditions affecting the extraction of the coal at the different mines and its preparation for market.[4] Besides these differences there may be other differences that affect the costs, in that better transportation facilities are afforded by the railroads to certain mines than to others in the same field. Also, in case the field is not completely unionized, there may be differences in the rate of wages paid for similar work.

[3] A description of the detailed form in which items of the cost of production were collected by the Federal Trade Commission will be found on p. 2-3 of the Commission's Coal Cost report No. 1, Pennsylvania—Bituminous (1919). The schedule used by the U. S. Coal Commission for the collection of costs followed closely the 1918 form of the Federal Trade Commission.

[4] A detailed statement of these differences will be found on p. 30-31 of the mimeographed copy of the Coal Commission's report on the "Cost of Production of Anthracite Coal."

The differences in factors affecting costs as between different mines in the same field are much more marked in their effects when costs of different fields are being compared. The result is a still wider range of costs.

If costs may differ so widely between mines in a given field, how is it that so many of the high-cost mines can continue in existence from year to year? This may be due to various causes. The coal that is being mined at a relatively high cost may come from a seam of very high-grade coal, which commands a fancy price because of its use for blacksmithing, or for coking, or for household fuel, or for gas making, while the coal from the thicker seams may be suitable only for steam raising. Or it may be that the age of the mine is the controlling factor, the mining practice at some mines being to mine, in its earlier years, the coal most accessible and cheapest to get out (mining "advancing"), while in other mines the mining practice is first to take out the dearest coal (mining "retreating"). Or it may be that in certain mines the installation of labor saving machinery has resulted in a relatively low labor cost. In accounting practice, the labor cost is included as a cost of operation, while there is no corresponding allowance made to operating cost for the *use* of the capital tied up in the investment in labor-saving machinery.

The cost of production of a particular mine is the resultant of many factors, and these do not continue constant, even for the same mine, over a long period of years. However, considering all of the mining operations in a given field, taken together as parts of a large unit of supply, it will be found that the costs of a large per cent of the production of that field, generally from 75 to 85 per cent, are grouped within a relatively narrow range, the extreme of the range for the field being due to the costs of a small proportion of the production produced at very low or high costs.

The more nearly uniform the physical conditions in a given field, the greater is the proportion of tonnage produced within the relatively narrow range of costs, of which the upper limit is the cost which is at a point of 75 to 85 on a scale of 100, on a

cumulative arrangement of the costs in the field from low to high. This natural grouping of costs in a field within a relatively narrow range (the "bulk line" cost) was used during war time coal regulation in connection with the determination of the maximum prices allowed to be charged for coal from a specified field.[5]

There are two questions of general interest in answering which cost of production statistics are of use. One question concerns the changes which have taken place from time to time in costs of production, the other question deals with the relationship existing between the operator's cost and what he received for his coal, with a view to measuring the profitableness of his business.

For the answer of the first question it is desirable to eliminate, as far as possible, the effect of differences in cost due to the various physical conditions affecting the different mines. This is secured by using for each period of time shown returns from the *same* operators. It is a fairly safe assumption that, however these various operators' costs may differ one from another, that at each period shown they will have the same *relative* difference, thus making the combined figures—the field averages—comparable. And if it can be shown that the operators whose statistics are used are fairly typical of the field, then their fluctuations of cost can safely be accepted as applying to the field as a whole. And this is also true when larger units than the single field are being compared.

In Appendix I of the Commission's report on "Cost of Production of Bituminous Coal" there are given at length detailed tables showing the average field costs of production and sales realization, stating the output obtained during a specified period, the per-ton labor, supplies and general expense costs, as well as the total f. o. b. mine cost (which is the total of these three items), the per-ton sales realization and the margin; that is, the difference between the f. o. b. mine cost and the sales realization.

[5] For a description of the methods used by the U. S. Fuel Administration for price-fixing purposes, see the "Report of the Engineers' Committee, 1918-1919" issued by the U. S. Fuel Administration (Washington, 1919).

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"Run of Mine"

While for many purposes the field figures are more useful, because they throw light directly on specific conditions in particular localities, for a broad view of the industry figures showing the general movement of costs and sales realizations over a wider area are desirable.

It was possible to compare the returns for 1922 with those of 1916 in the case of 217 operators in 31 fields and 11 States. These 217 operators produced for market or coking purposes about 66,000,000 tons in 1916 and 52,000,000 in 1922. That formed about 13½ per cent of the total output in the United States in 1916 and 12½ per cent in 1922. Their average sales realization in 1916 was $1.35 per ton as compared with the U. S. Geological Survey's figure of $1.32 for average value at the mine of all coal produced in the United States in 1916. Their average sales realization in 1922 was $2.97 per ton as compared with the Geological Survey figure of $3.02. Judged from that standpoint their combined figures can be considered as fairly representative of general conditions.

The labor cost per ton of these 217 operators averaged 83 cents per ton of 2,000 pounds in 1916 as compared with $1.82 in 1922, their total f. o. b. mine cost, $1.12 in 1916, as compared with $2.51 in 1922, their total sales realization $1.35 as compared with $2.97, and their margin 23 cents as compared with 46. Expressed in percentages their output in 1922 was about 21 per cent lower than in 1916, their labor cost 119 per cent higher, their total f. o. b. mine cost 124 per cent and their sales realization 120 per cent.

In 1916 their labor cost formed 74.1 per cent of the total cost and 61.5 per cent of the sales realization; in 1922 it formed 72.5 per cent of the cost and 61.3 per cent of the sales realization. Their total f. o. b. mine cost formed 83.0 per cent of the sales realization in 1916 and 84.5 per cent in 1922.

Complete figures for the cost of production for all of 1920 were not available for more than a few operators. Total f. o. b. mine costs, but not labor costs, were available, however (from

TABLE 5

1918, 1919, and 1920 costs, sales realizations and margins of 264 operators in 45 fields in 17 states

GRAND DIVISION	JANUARY–DECEMBER, 1918				JANUARY–DECEMBER, 1919			
	Production	Total f.o.b. mine cost	Sales realization	Margin	Production	Total f.o.b. mine cost	Sales realization	Margin
	million tons				*million tons*			
Northern Appalachian	33.1	$1.89	$2.58	$0.69	32.1	$2.22	$2.45	$0.23
Southern Appalachian	12.0	2.00	2.68	.68	10.8	2.40	2.67	.27
Eastern Interior	33.6	1.84	2.31	.47	21.7	2.12	2.31	.19
Western Interior and Southwestern	3.4	2.70	3.12	.42	2.5	3.09	3.18	.09
Great Plains, Rocky Mountains and Pacific Coast	4.5	2.23	2.94	.71	4.1	2.76	3.05	.29
United States	86.6	1.93	2.53	.60	71.2	2.28	2.50	.22
	JANUARY–MARCH, 1920				APRIL–SEPTEMBER, 1920			
Northern Appalachian	8.0	2.40	2.72	.32	17.2	3.09	4.31	1.22
Southern Appalachian	3.1	2.52	2.69	.17	5.5	2.97	3.92	.95
Eastern Interior	8.1	2.16	2.47	.31	13.6	2.58	3.20	.62
Western Interior and Southwestern	1.0	2.99	3.36	.37	1.6	3.52	3.85	.33
Great Plains, Rocky Mountains and Pacific Coast	1.5	2.93	3.27	.34	2.4	3.26	3.66	.40
United States	21.7	2.39	2.69	.30	40.3	2.93	3.82	.89

Rates of increase (I) or decrease (D) of 1919 and 1920 costs, sales realizations and margins from those of 1918

GRAND DIVISION	JANUARY–DECEMBER, 1919			JANUARY–MARCH, 1920			APRIL–SEPTEMBER, 1920		
	Total f.o.b. mine cost	Sales realization	Margin	Total f.o.b. mine cost	Sales realization	Margin	Total f.o.b. mine cost	Sales realization	Margin
	per cent	*per cent*	*per cent*	*per cent*	*per cent*	*per cent*	*per cent*	*per cent*	*per cent*
Northern Appalachian	*I* 17.4	*D* 5.0	*D* 66.7	*I* 27.0	*I* 5.4	*D* 53.6	*I* 63.5	*I* 67.0	*I* 76.8
Southern Appalachian	*I* 20.0	*D* 0.3	*D* 59.4	*I* 26.0	*I* 0.3	*D* 73.9	*I* 48.5	*I* 46.3	*I* 39.2
Eastern Interior	*I* 15.2	0.0	*D* 59.6	*I* 17.4	*I* 6.9	*D* 34.1	*I* 40.2	*I* 38.6	*I* 31.9
Western Interior and Southwestern	*I* 14.4	*I* 1.9	*D* 78.6	*I* 10.7	*I* 7.7	*D* 11.9	*I* 30.4	*I* 23.4	*D* 21.4
Great Plains, Rocky Mountains and Pacific Coast	*I* 23.8	*I* 3.7	*D* 59.1	*I* 31.4	*I* 11.2	*D* 52.1	*I* 46.2	*I* 24.5	*D* 43.7
United States	*I* 18.1	*D* 1.2	*D* 63.2	*I* 23.8	*I* 6.3	*D* 50.0	*I* 51.8	*I* 51.0	*I* 48.3

records of the (Calder) Senate Committee on Reconstruction),[6] which covered the year 1919 and the first three quarters of 1920. It was possible to compile for 264 operators in 45 fields in 17 States their total f. o. b. mine costs, sales realizations and margins for 1918 (from their reports to the Federal Trade Commission) for 1919, January-March, 1920, and April-September, 1920 (from the Calder Committee records.) Table 5, pp. 98 and 99, shows, by grand divisions and total for the United States, their production, total f. o. b. mine costs, sales realizations and margins.

The 264 operators produced about 86,500,000 tons in 1918, and 71,000,000 tons in 1919. Only the production for the first nine months of 1920 was secured, this being about 62,000,000 tons.

TABLE 6

	AVERAGE VALUE AT MINE PER NET TON (ALL COAL)	AVERAGE SALES REALIZATION OF 264 OPERATORS PER NET TON
1918	$2.58	$2.53
1919	2.49	2.50
1920	3.75	January–March 2.69
		April–September 3.82

Their production in 1918 formed about 15.3 per cent and in 1919 about 15.6 per cent of the total output for those years.

A comparison of the average sales realizations of these 264 operators with the average statistics of value at mine for the total production, as found by the U. S. Geological Survey,[7] is shown in table 6.

[6] The Senate Committee on Reconstruction and Production, 66th Congress, 3d session (the "Calder Committee"), through subpœna from the files of the National Coal Association, secured certain cost information which had been reported to the Association by many operators. Certain compilations made from this material, by employes of the Calder Committee, were presented before the Senate Committee on Manufactures (the "La Follette Committee"), as well as certain other compilations made by employees of the National Coal Association. (Hearing before Committee on Manufactures, U. S. Senate, 66th Congress, 3rd session, on S. 4828, Washington, 1921.)

[7] The "average value" shown by the U. S. Geological Survey, is defined

Throughout 1918 the wage scale remained unchanged, and all but a small part of the coal was sold at Fuel Administration prices. There was a depressed market following the Armistice which lasted for about a year, ending with the urgent demand that was induced by the widespread strike in the unionized fields in November of 1919. Work was resumed at a higher wage scale and the costs of January-March, 1920, reflect the higher wage. The Fuel Administration price regulations were re-established. As a result of the higher costs a lower margin was obtained in January-March, 1920, than in 1918. On April 1, 1920, a still higher wage scale went into effect, as a result of the award of the Bituminous Coal Commission, while at the same time Governmental price regulation was terminated. The railroad strike in the spring of 1920 interfered with the free movement of the coal from several important eastern fields, and a

as follows, on p. 528 of "Coal in 1919, 1920 and 1921," U. S. Geological Survey (Washington, 1923):

The value given in this report is the value realized at the mine f. o. b. cars, and the average value per ton is the average value realized, obtained by dividing the total value by the number of tons sold or produced. Coal used at the mine, coal coked by the producing company, and coal used in some other industry by that company—in all forming a considerable part of the total output—is not sold, and the value placed upon it is either estimated or is the amount at which it is carried on the company's books. Either value is presumably the amount the coal would have brought if it had been sold or the cost of other fuel for the purposes stated if it had been purchased. In other words, the values given represent returns to the operators for coal actually sold plus the estimated value of that not sold. The value thus fixed is more or less arbitrary and does not necessarily represent the current prices for coal sold commercially. Many mines are owned by consumers who take all or a great part of their output at nominal prices. The output of such mines is not known accurately, but it is probably between 20 and 25 per cent of the entire output. Even where the coal is actually sold large quantities may be moved on "cost plus" contracts that provide for prices far below both the average spot prices in the field or the average prices realized on deliveries by ordinary contracts. The figures in the tables therefore do not necessarily show prices or even an average of the prices of coal at the mines. Taken over a period of years, however, they do furnish an index to the rise and fall in the value of coal.

TABLE 7

1918 and 1922 costs, sales realizations and margins of 1180 operators in 83 fields

	1918					1922				
	Production	Cost		Sales realization	Margin	Production	Cost		Sales realization	Margin
		Labor	Total f.o.b. mine				Labor	Total f.o.b. mine		
	million tons					*million tons*				
Northern Appalachian:										
Union fields	134.0	$1.43	$2.00	$2.70	$0.70	63.8	$1.99	$2.93	$3.24	$0.31
Non-union fields	82.1	1.28	1.88	2.49	.61	65.1	1.51	2.36	2.72	.36
Total	216.1	1.38	1.95	2.62	.67	128.9	1.74	2.64	2.98	.34
Southern Appalachian:										
Union fields	0.7	1.57	2.06	3.01	.95	0.3	2.37	3.56	3.53	.03*
Non-union fields	29.1	1.43	2.06	2.71	.65	25.6	1.47	2.27	2.64	.37
Total	29.8	1.44	2.06	2.71	.65	25.9	1.49	2.28	2.65	.37
Eastern Interior:										
Union fields	77.3	1.45	1.87	2.36	.49	52.6	1.95	2.54	3.02	.48
Non-union fields										
Total	77.3	1.45	1.87	2.36	.49	52.6	1.95	2.54	3.02	.48
Western Interior and Southwestern:										
Union fields	18.4	2.20	2.74	3.01	.27	8.4	3.02	3.92	3.86	.06*
Non-union fields	0.3	2.33	3.26	3.36	.10	0.2	3.34	4.48	5.00	.52
Total	18.7	2.20	2.75	3.01	.26	8.6	3.03	3.94	3.88	.06*

Great Plains, Rocky Mountains and Pacific Coast:										
Union fields	16.6	1.55	2.04	2.55	.51	11.6	2.04	2.84	3.23	.39
Non-union fields	14.2	1.72	2.34	2.80	.46	10.0	2.00	2.91	3.37	.46
Total	30.8	1.63	2.18	2.67	.49	21.6	2.02	2.88	3.30	.42
East of Mississippi River:										
Union fields	212.0	1.44	1.95	2.58	.63	116.7	1.97	2.76	3.14	.38
Non-union fields	111.2	1.33	1.93	2.52	.59	90.7	1.49	2.33	2.70	.37
Total	323.2	1.41	1.94	2.56	.62	207.4	1.76	2.57	2.95	.38
West of Mississippi River:										
Union fields	35.0	1.89	2.42	2.79	.37	20.0	2.45	3.29	3.49	.20
Non-union fields	14.5	1.74	2.36	2.82	.46	10.2	2.03	2.94	3.40	.46
Total	49.5	1.85	2.40	2.80	.40	30.2	2.30	3.18	3.46	.28
United States:										
Union fields	247.0	1.51	2.01	2.61	.60	136.7	2.05	2.84	3.19	.35
Non-union fields	125.7	1.37	1.98	2.57	.59	100.9	1.55	2.39	2.77	.38
Total	372.7	1.46	2.00	2.60	.60	237.6	1.84	2.65	3.01	.36

* Total f.o.b. mine cost exceeded sales realization.

buyers' panic took place in the summer and fall of 1920. In the early fall there was a substantial increase in the wages paid to day men in many of the fields. The higher costs of April-September, 1920, as compared with January-March, reflect to a large measure the two wage increases over the wage scale of the earlier period.

The sales realization increased to a marked degree in the northern and southern Appalachian fields. In the northern Appalachian the total cost increased about 29 per cent over that of January-March, and the sales realization 58 per cent; in the southern Appalachian the increase in total cost was 18 per cent and in sales realization 46 per cent. In the other regions the rate of increase in costs was somewhat less, and in sales realizations very materially less.

The Coal Commission obtained reports direct from operators covering their costs and sales realizations for 1921 and 1922. Reports for 1918 to the Federal Trade Commission from many of the same operators were also available, and table 7 (pp. 102-3) summarizes the costs, sales realizations and margins in 1918 and 1922 of 1,180 operators in 83 fields in 23 States. These 1,180 operators produced 66 per cent of the total output in 1918 and 57 per cent in 1922. Their average sales realization in 1918 was $2.60 net per ton, as compared with $2.58, the U. S. Geological Survey average value at mine for the total production, and in 1922 their average sales realization was $3.01, as compared with the Geological Survey figure of $3.02 for value at mine.

In considering the total costs for 1922 it should be borne in mind that the costs in the Union fields show greater increases over 1918, in part because of the higher wage scales in effect, and in part because of the carrying charges during the five months' strike when there was no production. In the non-union fields there had been cuts in wages in 1921 and early 1922, which brought the costs down nearly to the 1918 level. In some non-union fields the labor costs in 1922 were actually lower than in 1918.

In considering the sales realizations for 1922 attention should

be called to the fact that in the union fields the figures cover three months of a period of low prices, and four months of a post-strike period of high prices, while during the nearly five months of strike there were no sales. Their sales realizations, therefore, for the year average higher through this cause than the sales realizations of the non-union fields, where in addition to the first three months of low demand there followed the five months' period when the operators very generally lived up to the agreement with Secretary Hoover (see Chapter II, page 86), that they would not take advantage of the heavy market demand caused by the scarcity brought about through the strike in the union fields to charge prices in excess of those formerly fixed by the Fuel Administration, making allowance for changes in cost since the war. On the termination of this agreement, which took place in some fields before the end of the strike, the operators in non-union fields, as well as those in unionized fields, obtained high sales realizations consequent on the heavy post-strike demand to replenish consumers' stocks. The average sales realization for the year in the case of the non-union operators is therefore derived from two periods, one of relatively low prices and the other of high prices.

In the following table there is shown the percentage that the labor cost formed of the total f. o. b. mine cost in 1918 and 1922, and the percentage that the labor cost and the total f. o. b. mine cost formed of the sales realization.

It is not possible here to present any detailed picture that would be accurate for any particular field. The material for such studies exists in the detailed tables of the Cost of Production Report, taken in connection with information available in the other reports of the Commission, such as "Wage Rates in the Bituminous Coal Industry."

Margins. That there have been high or low costs, sales realizations or margins means little of itself. The reasons why these figures have been high or low, and why they change so radically from time to time, are the vital considerations. For such use of

the figures intensive studies and not broad generalizations are necessary.

There are two sources of information that will throw light on the profits of the operators' business. One is the margin (that is the difference between the per-ton total f. o. b. mine cost

TABLE 8

REGION	1918 PROPORTION LABOR COST FORMED OF		1922 PROPORTION LABOR COST FORMED OF	
	Total f.o.b. mine cost	Sales realization	Total f.o.b. mine cost	Sales realization
	per cent	*per cent*	*per cent*	*per cent*
Northern Appalachian	70.8	52.7	65.8	58.4
Southern Appalachian	70.0	53.2	65.3	56.2
Eastern Interior	77.5	61.4	76.8	64.6
Western Interior and Southwestern	80.0	73.2	76.9	78.2
Great Plains, Rocky Mountains and Pacific Coast	74.7	61.0	70.2	61.2
United States	73.0	56.2	69.4	61.1

	PROPORTION TOTAL F.O.B. MINE COST FORMED OF SALES REALIZATION	
	1918	1922
	per cent	*per cent*
Northern Appalachian	74.4	88.6
Southern Appalachian	76.0	86.0
Eastern Interior	79.2	84.1
Western Interior and Southwestern	91.4	101.5
Great Plains, Rocky Mountains and Pacific Coast	81.7	87.3
United States	77.0	88.0

and sales realization), the other is the rate of return on the investment.

As an indication of the profitableness of the business, the margin is not an exact measure. It is by no means "clear profit;" the margins here shown include any Federal tax that had to be paid. It is not directly correlated to the investment, and so of

itself can give no light on the return received on the investment. One operator may have his mine fully equipped with mining and underground-loading machinery and use electrical haulage, while his neighbor mines his total output with pick miners and uses mule haulage, which means the employment of mule drivers. The first operator will show a relatively low labor cost per ton, i.e., the amount paid in wages divided by the tonnage produced, while the second will show a relatively large labor cost. Now, while there is an allowance for the depreciation or wearing out of the labor-saving equipment, which is included in the general expense cost of the first operator, there is no allowance at all for the *use* of the money tied up—it may be for years—in this equipment. The depreciation allowance included in the cost is merely designed to *replace* the *original* value, when the equipment has been worn out. Therefore if the first operator, using labor-saving equipment, is to receive the same return on his investment as his neighbor, who has pick mining and mule haulage, the first operator's margin must be larger than the second operator's by an amount equal to what is necessary to pay for the use of the capital tied up in labor-saving machinery, which is responsible for the lower cost per ton.

The margin, however, is extremely useful in throwing light from time to time on the profitableness of the business of a group of the *same* operators at each period, although these operators differ between themselves in the character of their investments. Any modification of the relative differences between them from one period to another is likely to be of slight importance.

In making comparisons of the margins at different periods for such a group of operators, it is of little value to consider the actual amounts in dollars and cents of margins received. It is their relation to the total f. o. b. cost or to the sales realization that is important. For example, the average margin of certain operators at one time might be 25 cents per ton and at a later time, 50 cents. Yet the larger margin might actually indicate a less profitable condition because the costs had more than doubled.

In the summary table shown on the preceding pages (see pp. 102-3) the actual amounts of the margins in dollars and cents are shown.

In the three following tables their relations to the total f. o. b. mine cost and to the sales realization are shown.

As has already been pointed out the information on margins throws no direct light on the rate of return on the investment, the method by which the profitableness of an industry is usually measured.

To get such a rate of return it is necessary first of all to find out the amount of the investment on which the rate must be

TABLE 9

1916 and 1922 margins of 217 operators in 31 fields in 11 states

PERIOD	AMOUNT OF MARGIN	RATIO THAT MARGIN BEARS TO	
		Total f.o.b. mine cost	Sales realization
		per cent	*per cent*
1916	$0.23	20.5	17.0
1922	0.46	18.3	15.5

figured. And there are many difficulties encountered in determining this basis. For example, the investment may be considered as merely the amount that the stockholders—the owners themselves—have in the business, to which may be applied the net income after deducting interest on borrowings. Or the investment may be considered as the total amount used in the business, whether belonging to the stockholders themselves or borrowed from others, to which would be applied the total net income. A second set of difficulties lies in the fact that in some cases the investment accounts on the books show the values as established by the original amounts invested by the stockholders years ago, and have little or no relation to the present market values of the property, while in other cases the investment values on the books include not only the original amounts put in the property, but

TABLE 10

1918, 1919 and 1920 margins of 264 operators in 45 fields in 17 states

REGION AND PERIOD	AMOUNT OF MARGIN PER NET TON	RATIO THAT MARGIN BEARS TO	
		Total f.o.b. mine cost	Sales realization
		per cent	*per cent*
Northern Appalachian:			
1918 (year)	$0.69	36.5	26.8
1919 (year)	.23	10.4	9.4
1920 (January–March)	.32	13.3	11.8
1920 (April–September)	1.22	40.6	35.3
Southern Appalachian:			
1918 (year)	.68	34.0	25.4
1919 (year)	.27	11.2	10.1
1920 (January–March)	.17	6.8	6.3
1920 (April–September)	.95	32.0	24.2
Eastern Interior:			
1918 (year)	.47	25.5	20.2
1919 (year)	.19	9.0	8.2
1920 (January–March)	.31	14.4	12.6
1920 (April–September)	.62	24.0	19.4
Western Interior and Southwestern:			
1918 (year)	.42	15.5	13.4
1919 (year)	.09	2.9	2.8
1920 (January–March)	.37	12.4	11.0
1920 (April–September)	.33	9.4	8.6
Great Plains, Rocky Mountains and Pacific Coast:			
1918 (year)	.71	31.8	24.2
1919 (year)	.29	10.5	9.5
1920 (January–March)	.34	11.6	10.4
1920 (April–September)	.40	12.3	10.9
United States:			
1918 (year)	.60	31.1	23.7
1919 (year)	.22	9.7	8.8
1920 (January–March)	.30	12.5	11.2
1920 (April–September)	.89	30.4	23.3

also appreciations of value ("write-ups") which have been added in order to bring the book investment amounts nearer to present market values. This practice has generally been connected with the establishment of a value to be used as a basis for the determination of Federal Income and Excess Profits taxes. Furthermore, in recent years there have been important consolidations of companies of many years' standing. In such cases the estimated market value of the property at the time of consolidation,

TABLE 11

1918 and 1922 margins of 1180 operators in 83 fields, in 23 states

REGION	1918			1922		
	Amount of margin per net ton	RATIO THAT MARGIN BEARS TO		Amount of margin per net ton	RATIO THAT MARGIN BEARS TO	
		Total f.o.b. mine cost	Sales realization		Total f.o.b. mine cost	Sales realization
		per cent	*per cent*		*per cent*	*per cent*
Northern Appalachian	$0.67	34.4	25.6	$0.34	12.9	11.4
Southern Appalachian	.65	31.6	24.0	.37	16.2	14.0
Eastern Interior	.49	26.2	20.8	.48	18.9	15.9
Western Interior and Southwestern	.26	9.5	8.6	.06*	1.5*	1.5*
Great Plains, Rocky Mountains and Pacific Coast	.49	22.5	18.3	.42	14.6	12.7
United States	.60	30.0	23.0	.36	13.6	12.0

* Total f.o.b. mine cost exceeded sales realization.

and not the original amounts invested by the stockholders of the former companies, became the original investment values as shown on the books of the new company formed through the consolidation.

There are various theories as to what is the proper method for arriving at the investment value to be used as a basis for computing a rate of profit. The Coal Commission in its report on "Investments and Profits in Anthracite Mining" went into this subject at some length.[8]

[8] For a discussion of the various theories of investment value to be used as a basis for computing rate of profit, see p. 6-10 and 28-30 of the

The information in its report on the "Investment and Profits of Bituminous Mining" was obtained by the Coal Commission from detailed reports made to it by the operators under oath. The tables were compiled directly from these reports. No revisions whatever were made by the Commission's accountants of the figures reported by the operators as "book values" with a view to altering in any way the effect produced either by appreciations or decreases in the values of assets, shown by the reports, nor were the net income figures adjusted to modify what various advocates might consider either excessive or insufficient charges for depletion, depreciation or amortization of property accounts. In other words, the Commission did not attempt to pass judgment on the validity of any "write-ups" or "write-downs" in the investment accounts or of the amounts of depletion, depreciation and amortization charge shown in the operators' sworn reports.

The inquiry was addressed to the largest operators only—those who produce 250,000 tons or more a year. It was possible to get usable records from 99 companies for the ten-year period 1913-1922, and for 141 additional companies for shorter periods. There were 88 operators whose accounts for the ten-year period were kept on the calendar-year basis. These operators had an average production of about 73,500,000 tons per year, or about 15 per cent of the country's output during that period. For the five-year period 1918-1922 returns were available on a calendar basis for 175 operators (including the above-mentioned 88 operators), whose production averaged about 142,000,000 tons per year or about 30 per cent of the total production. For the three-year period 1920-1922 there were available calendar-year reports from 215 operators (including the foregoing), who produced from 31 to 38 per cent of the total output during those three years. This total output, however, includes coal produced by "Consumer-owned" companies, none of which is included among the companies used in the investment and profit tables, because the "consumer-

mimeographed copy of the Coal Commission's "Report on Investments and Profits in Anthracite Mining," also p. 4-5 of the mimeographed copy of the reports on "Cost of Production of Anthracite Coal."

owned" companies generally do not carry their investment and earnings applicable to the coal properties as a distinct business, but rather as a department or part of the total business of the company in control.

There are wide differences between the investment and profits reported by different operators in the same field, as well as between the different fields considered as a whole. The use of combined figures and the generalizations to be drawn from them

TABLE 12

REGION	NUMBER OF OPERATORS	1920		1918–1922	
		Production	Average per ton investment	Average yearly production	Average per ton investment
Northern Appalachian	95	86,289,408	$6.88	80,720,377	$7.06
Southern Appalachian	17	10,328,552	5.83	9,174,699	6.34
Eastern Interior	47	41,958,312	1.99	36,644,838	2.31
Western Interior and Southwestern	3	3,273,149	3.84	2,446,930	5.96
Great Plains, Rocky Mountains and Pacific Coast	13	15,526,557	7.96	13,363,049	9.10
United States	175	157,375,978	5.49	142,349,893	5.95

are subject to the same qualifications as those pointed out in connection with general figures of costs, sales realization and margins.

The investment per ton. The per-ton investment is found by dividing the total number of tons produced into the total amounts of money involved in the coal-production operations, whether invested by the stockholders or borrowed on notes or bonds from outside sources.

Since the production varies greatly from year to year it is obvious that with an unchanged investment figure the rate of investment per ton might show important differences from year to year because of changes in the production tonnage brought about through variations in the market demand for coal or suspensions of production due to transportation or labor difficulties.

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A Veteran Miner

For this reason in table No. 12 figures of investment per ton are stated in two ways for the same 175 companies, one set showing the investment based on their average 1920 production (of about 157,000,000 tons), and the other during the five-year period 1918–1922 based on their average annual production (about 142,000,000 tons).

The wide variations in amount of the per-ton investment shown between the various Grand Divisions are due to several causes,

TABLE 13

Average per ton investment of 88 companies for 1913–1916, 1917–1922, and for the entire ten-year period

REGION	NUMBER OF COMPANIES	1913–1916		1917–1922		1913–1922	
		Average yearly production	Total investment per ton	Average yearly production	Total investment per ton	Average yearly production	Total investment per ton
		net tons		*net tons*		*net tons*	
Northern Appalachian	52	49,983,903	$3.19	43,930,930	$5.67	46,352,119	$4.60
Southern Appalachian	10	6,234,371	3.76	6,575,533	3.76	6,439,068	3.76
Eastern Interior	20	13,729,844	1.65	14,990,561	2.10	14,486,270	1.93
Western Interior and Southwestern	1	2,204,979	3.38	1,696,604	7.09	1,899,854	5.36
Great Plains, Rocky Mountains and Pacific Coast	5	4,422,861	4.47	4,386,331	6.75	4,400,943	5.84
United States	88	76,575,958	3.04	71,579,959	4.85	73,578,254	4.09

chief among them being differences in the mining conditions encountered, the greater use of expensive mining equipment in some regions than in others, the holding of reserves of coal land (see Chapter III, Section 1, Royalties), and the adoption to a greater extent of the practice of entering on the books, in recent years, appreciations of value arising from the revaluation of property assets. The effect of this latter practice is brought out by table No. 13, which shows the average per-ton investments of

88 companies for 1913-1916, for 1917-1922 and for the entire ten-year period.

While some part of the differences between the 1913-1916 averages per ton, and those of 1917-1922 for the same companies may be attributable to changes in the rate of production, or to investment of new capital, or to allowing a part or all of the accumulated profits to remain in the business, the larger part in some regions is attributable to the revaluations made since 1916 in property assets. The following table shows the proportion of the amount shown as total investment which such revaluation formed in the case of the foregoing 88 companies:

TABLE 14

REGION	NUMBER OF COMPANIES	PROPORTION THAT APPRECIATED SURPLUS IN 1920 FORMED OF TOTAL INVESTMENT IN 1920
		per cent
Northern Appalachian	52	34.9
Southern Appalachian	10	No appreciation reported
Eastern Interior	20	15.1
Western Interior and Southwestern	1	1.5
Great Plains, Rocky Mountains and Pacific Coast	5	51.2
United States	88	31.7

Returns on investment. The method used in constructing the investment figures shown on the books has an important bearing on the rate of return on investment. The book investment may reflect merely the original amounts put in by the stockholders, with such surplus from earnings as may have accumulated in excess of dividends paid, or it may have been changed from time to time by adjustments due to the revaluations of property assets. Because of the lack of uniform accounting practices throughout the industry any presentation of the returns on investment is subject to certain inherent defects. Subject to these limitations it is possible, however, to throw some light on the general course on profits. In table 15, page 116, are shown for the same oper-

ators rates of return before deduction of Federal Income and Excess Profits taxes on "Stockholders' Equity," and on "Total Investment in Coal Operations." The Stockholders' Equity is the amount that would accrue to the owners of the business (the stockholders) in case of liquidation and of the assets being sold for the amount at which they appear on the books—such assets including not only the property used in coal operations but also outside investments. The net income applicable to the Stockholders' Equity (before deduction of Federal taxes) includes income derived from, or losses due to outside investments, as well as the net income received from coal-producing operations. The total investment in Coal Operations represents the total amount of money used in the coal operations exclusively. It includes money borrowed as well as that which belongs to the stockholders. Investments in enterprises outside of coal are excluded.

In the case of both sets of net incomes—that applicable to Stockholders' Equity and that to Total Investment in Coal Operations—the income used is a net income *before* deduction of Federal taxes. The reason why these taxes are not deducted is because of the impossibility of ascertaining accurately from the returns to what years the tax payments in a given year are applicable. This is chiefly due to the inclusion of a certain amount of additional taxes and refunds for previous years in the figures of the tax payment shown for a given year.

In table 16, p. 118, the Federal taxes paid by the 88 companies during 1917-1922 are shown by years on a per-ton basis, obtained by dividing the payment reported for each year by the tonnage of the year preceding, the assumption being made that most of the tax paid in a given year related to the operations of the year directly preceding.

Federal income and excess profits tax statistics. Through the courtesy of the Treasury Department, certain tabulations prepared by Mr. Edward White, head of the Statistical Division, Income Tax Unit, were furnished to the Coal Commission. These figures were tabulated from the returns as originally submitted

TABLE 15

Rates of return on stockholders' equity and total investment in coal operations, and net income on total investment per ton of production for 88 companies in 1913–1922, and 215 companies in 1920–1922

(Before deduction of Federal taxes)

YEAR	NORTHERN APPALACHIAN 52 companies			SOUTHERN APPALACHIAN 10 companies			EASTERN INTERIOR 20 companies			WESTERN INTERIOR AND SOUTHWESTERN 1 company			GREAT PLAINS, ROCKY MOUNTAINS AND PACIFIC COAST 5 companies		
	Return on stockholders' equity	Return on total investment	Return on total investment per ton	Return on stockholders' equity	Return on total investment	Return on total investment per ton	Return on stockholders' equity	Return on total investment	Return on total investment per ton	Return on stockholders' equity	Return on total investment	Return on total investment per ton	Return on stockholders' equity	Return on total investment	Return on total investment per ton
	per cent	*per cent*		*per cent*	*per cent*		*per cent*	*per cent*		*per cent*	*per cent*		*per cent*	*per cent*	
1913	6.9	5.8	$0.18	5.3	5.2	$0.18	0.9	2.6	$0.04	5.2	8.8	$0.23	7.6	12.3	$0.43
1914	4.8	4.3	.15	3.7	3.7	.15	5.3*	2.3	.04	3.7	5.6	.17	3.0	3.0	.14
1915	4.9	4.6	.14	2.0	2.4	.10	1.4	2.3	.04	3.4	4.9	.21	2.4	4.1	.24
1916	11.0	8.0	.25	2.5	2.7	.09	7.4	6.8	.12	3.4	5.4	.21	3.6	6.1	.26
1917	27.8	23.0	.91	17.5	15.5	.51	27.4	23.1	.36	8.1	10.6	.41	4.3	7.0	.36
1918	17.4	15.9	.74	16.5	16.1	.53	22.6	20.6	.34	10.6	12.3	.58	4.9	6.7	.41
1919	7.1	6.9	.35	12.4	12.0	.46	9.3	9.0	.24	.7	1.6	.12	3.7	4.4	.35
1920	19.5	19.3	1.09	21.7	21.9	.79	29.3	27.6	.56	11.5	12.9	.58	5.7	7.1	.44
1921	4.7	4.9	.34	8.7	9.6	.45	5.5	5.6	.13	3.5*	2.5*	.31*	5.5	6.5	.52
1922	4.6	4.7	.43	5.8	6.1	.25	20.3	20.0	.55	3.4*	2.5*	.51*	4.7	6.2	.49
Average (1913–1922).....	11.1	10.0	.46	9.9	9.7	.36	14.2	12.9	.25	3.5	4.5	.25	4.5	6.2	.36

	111 companies			19 companies			64 companies			3 companies			18 companies		
1920	16.0	15.8	1.05	14.9	14.1	.90	30.9	28.7	.56	13.3	14.4	.55	5.3	6.4	.52
1921	4.2	4.0	.31	4.2	4.9	.41	5.9	5.7	.14	.5*	.1	.01	3.2	3.3	.36
1922	4.4	4.2	.42	3.9	4.3	.29	16.0	15.1	.49	1.8*	1.3*	.18*	3.9	4.0	.43
Average (1920–1922).....	8.0	8.0	.63	7.6	7.9	.56	17.3	16.2	.40	3.1	3.2	.24	4.1	4.6	.44

* Loss.

Note: The 88 operators had an average yearly production during 1913–1922, of about 74,000,000 tons, and the 215 operators had an verage yearly production during 1920–1922, of about 159,000,000 tons.

to the Treasury Department by the operators before being examined by the Income Tax Division with a view to acceptance or revision. The amounts appearing for capital invested, for income or for taxes paid do not show the actual amounts eventually arrived at and accepted as final. They do show the amounts as

TABLE 16

Federal income and excess profits of 88 operators in cents per ton of production

YEAR TO WHICH TAX PAID PRINCIPALLY APPLIES	NORTHERN APPALACHIAN	SOUTHERN APPALACHIAN	EASTERN INTERIOR	WESTERN INTERIOR AND SOUTH-WESTERN	GREAT PLAINS, ROCKY MOUNTAINS AND PACIFIC COAST	UNITED STATES
	52 companies	10 companies	20 companies	1 company	5 companies	88 companies
1916	0.4	0.0	3.7	0.3	0.7	1.0
1917	31.5	9.2	12.8	2.0	5.5	22.2
1918	31.1	17.8	14.0	3.3	5.6	23.7
1919	5.9	8.3	6.3	0.4	3.6	5.9
1920	27.6	21.7	17.5	9.2	3.6	22.8
1921	5.1	8.0	2.5	12.1	6.8	5.0

TABLE 17

Per cent of net income to invested capital

YEAR	BEFORE DEDUCTING TAX	AFTER DEDUCTING TAX
	per cent	*per cent*
1917	26.47	17.26
1918	16.04	8.95
1919	6.33	5.01
1920	25.07	17.41
1921	2.59	1.65
Average (1917–1921).....	14.47	9.54

originally reported, and such figures are very valuable for broad generalizations covering the industry.

One set of tables covers returns from 1,234 operators, for whom reports for the five-year period 1917-1921 were available. These showed the rates of return listed in table 17.

3. COSTS AND PROFITS OF BITUMINOUS WHOLESALERS AND RETAILERS

In a typical week, when the market is active, the mines will load 225,000 railroad cars, holding about 11,000,000 tons of coal and coke. These 225,000 cars must be picked up from 9,000 commercial mines in 92 districts in 26 States (to say nothing of other thousands of wagon mines) and delivered to 90,000 carload lot buyers in 48 States. The task involves not only the world's biggest single job of transportation, but also an intricate job of wholesale marketing.

The marketing is reduced to its simplest terms when a large consumer like a railroad or steel plant buys a mine and consumes its entire output. Perhaps 20 or 25 per cent of the total production is now handled in this way and the proportion is increasing.

In contrast to such "captive" mines the commercial operators must find a market for their product. The large producers have built up their own sales organization, which may be either a selling department of the operating company or a separately incorporated but financially related marketing company.

The smaller producers commonly sell to independent commission agents or independent jobbers, who buy outright and sell as independent merchants for a merchandizing profit. Since the sales department and the affiliated sales company or agency is in reality a part of the producing organization, the Coal Commission followed the terminology of the trade and applied the term "wholesaler" to individuals or corporations not directly affiliated with the companies whose coal they handle, who sell to retailers or consumers in carload lots without physically handling the coal on, over or through their own yards, docks or other equipment. Thus defined, the term includes commission sales agents not directly affiliated with the mines whose coal they handle and independent wholesalers buying and selling on their own account as independent merchants.

The independent wholesaler and commission sales agent exist because under normal market conditions they can render the necessary distribution service—particularly to small operators, of

whom there are literally thousands—more cheaply than the operators could themselves perform the same service over their entire distribution territories. To large operators who have extensive sales organizations of their own the wholesaler offers an outlet for tonnage in any territory not adequately covered by the operator's sales organization.

The services rendered by wholesalers, both to the producer and to the purchaser, may be summarized briefly as follows:

To the producer:

1. Offering a ready sales organization to small mines whose tonnage is inadequate to warrant them in maintaining their own selling organizations.
2. Offering a similar service to large operators in markets not fully covered by the operator's sales organization.
3. Advancing for small operators a certain amount per ton immediately upon notice of shipment, thus financing payrolls for further operation.

To the purchaser:

1. Offering a wide selection of fuels and, in some cases, fuel engineering advice respecting the different kinds of coal handled.
2. Extending credit.
3. Providing a ready connecting link between the purchaser and the producer.
4. Finding coal for a consumer in times of shortage.

The typical wholesaler. Few wholesalers confine their activities either to selling coal on a commission basis or to buying and selling as independent merchants. In fact, the functions of commission sales agent, independent wholesaler and even that of sales department for one or more mines may be performed by the same organization. Because of this overlapping of functions the typical wholesaler often carries on a business made up in varying proportions of commission sales and independent merchandizing.

The wholesaler's principal concern is an assured supply of tonnage. To procure this many establish relationships with new mines or with older but financially weak mines, under which the

wholesalers advance to the mines, upon notice of shipment, a certain amount per ton, thus financing the mines for further operation. Such relationships, particularly on the part of older, well established, financially strong wholesalers, are very numerous. It is claimed and in many cases it is true within certain limits that wholesalers thus foster the development of new mines and keep in operation inefficient old mines which otherwise would be unable to remain in operation.

Too many wholesalers. Representatives of the American Wholesale Coal Association classify those engaged in the trade under two heads, namely, "regular" or "established" wholesalers, whose membership is sought, and "snowbirds," whose presence in the trade is decried by the Association. "Regular" or "established" wholesalers are those who are steadily engaged in the business year after year, while "snowbirds" are those who engage in the business only when there is opportunity for large profits and quit when the opportunity for such profits is past. The small amount of capital required to engage in the business, particularly in times of sellers' markets, when sales can be made to a large extent on a cash basis, makes "snowbirding" not only easy but highly profitable whenever there is a shortage of coal.

Frequently recurring shortages in recent years have attracted so many "snowbirds" who have remained in the trade, thus becoming "regular" or "established" dealers, that the trade itself complains that there are too many wholesalers. It is claimed that too many wholesalers result in reduced tonnage per wholesaler, with consequently increased costs. Greater efficiency undoubtedly might be attained if there were fewer wholesalers handling larger tonnages at lower costs per ton. But so long as frequently recurring shortages result in violent market-price fluctuations which offer opportunity for large speculative profits on the part of wholesalers, and competition alone is relied upon as the principal regulator of the trade, little reduction in the excessive number of wholesalers can be expected. Only uninterrupted production and distribution resulting in price stability over long periods of time can make it possible for price competition among

wholesalers, both for the producer's tonnage and the consumer's trade to reduce wholesale margins to a level commensurate with distribution services rendered and bring about the elimination of unnecessary wholesalers.

Wholesale margins, expenses and profits. The wholesaler's remuneration is taken in the form either of a commission or a gross profit, commonly spoken of in the trade as the wholesaler's "margin." This margin includes all expenses of wholesaling as well as the wholesaler's profit. Margin as defined for the wholesale trade therefore differs from the term margin as used by the Commission for operators of mines. The investment figures upon which rates of profit on investment shown in the Coal Commission's studies of the retail and wholesale trade are based include the book values of capital stock plus surplus and borrowed money, including bonds, minus good-will and outside investments.

The Coal Commission's study of margins, costs, profits and investments of wholesalers covered the ten-year period from 1913 to 1922, inclusive. This was a period of rising prices for all kinds of coal, necessitating an increase in the amount of capital required to finance the wholesaling of a ton of coal. Margins and expenses per ton increased sharply and net profits per ton fluctuated widely.

To one not familiar with the wholesale trade the smallness of average margins, expenses and profits per ton in times of normal market demand when violent price fluctuations are absent, and the large returns on investment yielded by net profits of but a few cents per ton will be surprising until it is recalled that the wholesaler's function is confined to selling coal *without actually handling* it, and in such a manner as to yield a rapid turnover of investment, and that therefore his actual investment per ton of coal sold is small. In times of shortage, however, the independent wholesaler buys at the lowest and sells at the highest prices obtainable, thereby obtaining high margins for coal that is not always of the best quality.

During the very active market of late 1922 the Coal Commission found cases in which margins up to $3.90 per ton were real-

ized on particular sales of bituminous coal by wholesalers who did not physically handle the coal. Margins of $1.25 to $2.00 per ton on particular sales were numerous, as might be expected in such a speculative market. Still other individual sales were made at a loss, the maximum loss reported being $2.25 per ton. Such margins are characteristic only of disturbed markets and are several times the average margins of normal times. When

TABLE 18

Tonnage margins, profits, investments and return on investment realized by wholesalers of bituminous coal, 1913–1922[9]

YEAR	NUMBER OF COMPANIES	TONNAGE HANDLED	MARGIN PER TON	NET PROFIT PER TON	INVESTMENT PER TON	RATE OF RETURN ON INVESTMENT*
			cents	*cents*	*cents*	*per cent*
1913	51	27,351,810	8.5	3.0	14.2	21.2
1914	60	27,611,393	8.9	2.8	16.2	16.9
1915	70	32,421,633	9.0	2.9	17.0	16.8
1916	82	40,725,146	12.6	6.3	17.6	35.9
1917	115	49,677,703	19.4	10.5	21.7	48.5
1918	135	57,212,512	15.3	6.9	21.4	32.4
1919	169	56,466,370	16.3	5.7	25.2	22.5
1920	228	86,958,380	29.6	14.1	25.3	55.8
1921	271	61,754,760	18.6	1.2	42.7	2.7
1922	299	86,650,000	21.3	7.1	29.4	24.0

* Rates of return shown in this column are obtained by dividing the total profit by the total investment for all wholesalers reporting in each year. They are therefore more accurate than rates based on the unit figures appearing in the two preceding columns because the small unit figures have been adjusted to read to the nearest tenth of a cent, thereby introducing an appreciable error for purpose of percentage computation.

a given shipment passes through the hands of two or more wholesalers before reaching the consumer the combined margins in times of shortage often represent more in the final selling price than was paid in wages to the miner who dug the coal, or to the retailer to cover his handling and delivery costs and profit.

For each of the years from 1913 to 1922, inclusive, a varying number of wholesalers, ranging from 51 for 1913 to 299 for

[9] Compiled from U. S. Coal Commission, "The Wholesale and Retail Coal Trade," mimeographed Report L, Table 4.

1922, reported to the Coal Commission that they handled bituminous coal exclusively. Table 18 shows the total tonnage handled, average margins, profits and investments per ton and rates of return on investment reported by wholesalers for each year.

The decrease in tonnage of bituminous coal handled per wholesaler in later years is significant. The table includes all companies handling bituminous coal exclusively from which usable reports were received by the Commission. It will be seen that for 1920 reports were obtained from 228 wholesalers, or four and one-half times as many as for 1913. Yet these 228 wholesalers handled only three times the tonnage reported by 51 wholesalers in 1913. In the strike year 1922, 299, or nearly six times as many wholesalers handled a tonnage but three times as great as was handled by the 51 wholesalers in 1913. These figures give a somewhat exaggerated picture of the increase in number of wholesalers, for, of course, those firms that were in existence in 1913, but had gone out of business or been reorganized before 1923, when the Commission made its study, would not be counted. The exaggeration, of course, is largest in the earlier years and least in the later years of the period for which a more representative group of wholesalers reported. But even allowing for this the table indicates a large increase in the number of wholesalers without an equivalent increase in tonnage and supports the claim previously mentioned that there are too many wholesalers.

Advances in prices necessitated the use of practically twice as much capital to finance the sale of a ton of coal in 1922 as was required in 1913. Notwithstanding the decrease in tonnage per wholesaler and increased capital required per ton, the average rates of return on investment, except for the dull year 1921, showed marked increases during and since the war.

In 1913 an average gross margin of 8.5 cents yielded an average net profit of 3 cents per ton, which returned 21.2 per cent on the total capital invested. In 1917, with average margins of 19.4 cents per ton and net profits of 10.5 cents per ton, a return of 48.5 per cent was realized on total investment. Fuel Administration control in 1918 reduced the average margin to 15.3 cents, and the average profit to 6.9 cents per ton, which yielded 32.4 per cent on total in-

vestment. In 1920, the year of maximum profits, average margins of 29.6 cents and net profits of 14.1 cents per ton yielded a return of nearly 56 per cent on total investment for all wholesalers, and in the strike year, 1922, average margins of 21.3 cents and net profits of 7.1 cents per ton yielded 24 per cent on total investment. Total investment, as here used, includes capital stock, plus surplus and borrowed money, minus goodwill and outside investments.

During the ten-year period the average wholesaler's margin has increased over two and a half times and his average net profit has more than doubled.

Narrow margins and profits for 1921, when coal was plentiful, reflect sharp competition among the large number of wholesalers attracted to the trade by the bonanza profit years 1917, 1918 and 1920. High profits of the boom years named above and sharply increasing tonnage and profits during the strike year 1922 point to the conclusion that years of strikes and shortages are the wholesalers' harvest time. Speculative risks in disturbed markets and keen competition in dull markets result in a considerable number of failures in the wholesale trade. It should be noted that the figures of costs and profits here given necessarily omit the firms that had failed and had gone out of business during the ten years, because such firms could not be reached to furnish information in 1923, when the inquiry was made. It is probable, therefore, that the level of profits here shown is somewhat above the average for all the capital engaged in the trade, especially in the earlier years.

Rate of capital turnover. It is frequently and truly stated that the wholesaler's net profit per dollar of sales after deducting his expenses is very small. It cannot be assumed from this fact that the wholesaler's profit on investment is, therefore, necessarily small. A study conducted by the Coal Commission covering the sales and investments of 81 identical companies handling both bituminous and anthracite coal for the ten years from 1913 to 1922, indicated that in different years for every dollar of capital invested, sales of from $7.20 to $18.40 were made. In other words, each dollar of capital invested was turned over from 7.2 to 18.4 times in different years. This explains how wholesalers

in good years, with net profits of but a few cents per ton, representing but one or two cents per dollar of sales, can realize the large profits on investment shown in table 18.[10]

Eight per cent margin. Representatives of the wholesale trade have advocated gross margins of 8 per cent of the selling price, or 8 cents per dollar of sales as being fair and reasonable to cover the wholesaler's expenses and net profit. A study of the margins of the wholesalers, whose profits are summarized in table 18, showed that in no year of the ten-year period did the wholesaler's margin amount to 8 per cent on sales. In 1913, 4 per cent margin on sales yielded 21.2 per cent net profit on investment; in 1917, 6.6 per cent margin yielded 48.5 per cent net profit on investment, and in 1920, with still higher prices of coal, 6.1 per cent margin on sales yielded 55.8 per cent on investment, the highest rate of return for the ten-year period.

This study led the Commission to the conclusion that

> Such a margin (8 per cent) would neither be necessary nor desirable. Its presence in the trade would not only be a public injustice, but would further stimulate the already greatly overdeveloped wholesale trade.[11]

The Coal Commission stated that coal is a prime public necessity, each step in the production and distribution of which is charged with public interest. The Commission recognized that the wholesaler is a necessary factor in the distribution of coal. It also recognized that in times of shortage, speculative activities on the part of more wholesalers than are necessary to handle the trade tend to enhance unduly the prices paid by the consumer. It included, therefore, wholesalers in its general recommendation that those who buy and sell coal in interstate commerce be licensed and be required to report to a Federal agency with power to prescribe the form of accounts. Although the Commission went on record against price-fixing by the Government, except in emergencies, it recommended that any fixing of jobbers' price in

[10] "Wholesale and Retail Coal Trade," U. S. Coal Commission, Report L, p. 13.

[11] "Wholesale and Retail Coal Trade," U. S. Coal Commission Report L, part 1, p. 9.

times of emergency should take the form of limiting the margin that may be collected by one or more wholesalers to a definite maximum per ton, the maximum amount to be the same whether taken by one or more than one wholesaler.

Dock companies. The dock companies of the Northwest conduct businesses combining wholesaling of coal in carload lots with retailing. Both anthracite and bituminous coals are handled, the bulk of the tonnage being bituminous purchased outright, while the anthracite is usually handled on consignment.

Dock coal, both bituminous and anthracite, is shipped by rail from eastern fields to the lower lake ports, from which it is transported by boats to the docks located at such cities as Duluth, Superior, Ashland, Milwaukee, Sheboygan, Manitowoc and Green Bay, on the western shores of Lake Superior and Michigan, and to a number of Canadian ports as well, where it is unloaded to the docks and shipped to inland points by rail or sold locally at retail as needed.

Bituminous coal has been handled in this manner for 50 years or more in amounts gradually increasing to 4,000,000 tons in 1896, 10,000,000 tons in 1905, 20,000,000 tons in 1915, and under pressure of war conditions to 28,000,000 tons in 1918.

One of the principal functions of the docks has always been the storage of coal during the summer for distribution as needed in the winter. Before the rapid development of the Indiana, southern Illinois and Wyoming coal fields the docks were in undisputed possession of the territory from the Great Lakes west to, or even beyond, the western boundary of the Dakotas, and south at least as far as the northern boundary of Iowa. Expansion of nearby coal fields and adequate year-round rail transportation has intensified price competition in the dock territory and all-rail coal has encroached upon dock territory until it is estimated that about one-half of the bituminous coal used in the dock area comes from all-rail sources, and the docks are left in undisputed possession only of the sparsely-settled northern part of the territory.

Encroachment of all-rail coal makes the summer purchase and storage of large quantities of coal an increasingly precarious business venture, as the docks are no longer sure of their ability

to move their coal at a profit in price competition with coal from all-rail sources. An unusually mild winter may further add to the difficulties of dock operations by decreasing the household demand, which represents a large part of the tonnage, and may make large carryovers necessary, thus tying up large amounts of working capital in inventories for long periods of time, while an unusually early closing of navigation in the fall, or an unusually late opening in the spring may be the cause of shortage in case inadequate supplies are stored in the summer.

Wholesale and retail margins and profits of dock companies. The Coal Commission secured reports from nine of the principal dock companies, six of which since 1913, and eight since 1920, conducted both wholesale and retail businesses, using the same investment for both. From these reports it was possible to compile wholesale and retail margins and profits per ton, but return on investment could be shown only for both branches of the business combined.

Average wholesale margins to cover physical handling of the coal ranged from $.538 to $1.066 per ton during the 10 years from 1913 to 1922. Expenses ranged from 34.0 cents to 72.9 cents per ton. In 1921 a loss of 13.2 cents per ton was shown, while for the other years profits varying in amount from 13.3 cents to 47.1 cents per ton were realized.[12]

Retail gross margins for companies reporting retail businesses ranged in different years from $.580 to $1.683 per ton. Retail expenses varied from $.688 to $1.327 per ton. Losses amounting to 11.8 cents, 11.9 cents and 10.8 cents per ton were shown, respectively, in 1913, 1914 and 1915. The remaining seven years showed retail profits ranging from 0.6 cents to 44.8 cents per ton.[13]

When the results for the two branches of the business were combined, profits on total investment for all companies were shown for every year except 1921, in which an average loss of two per cent was shown by all companies. In four years small profits yielded rates of return on total investment varying from 5.7 per cent to 7.8 per cent. During the remaining years larger profits

[12] "Wholesale and Retail Coal Trade," U. S. Coal Commission p. 75.
[13] "Wholesale and Retail Coal Trade," U. S. Coal Commission, p. 76.

yielded rates of return on investment ranging from 10.3 per cent to 20.7 per cent.[14] These rates of return, it will be noted by comparison with table 18, indicate that because of competition of all-rail coal and general precariousness of the business, due to its dependence upon weather conditions, etc., the dock business is far less profitable than that of the wholesaler, who does not physically handle the coal he sells.

Description of the retail trade. The typical retailer of coal is an independent merchant, who owns or leases his own yard and delivery equipment, buys in carload, and delivers in less than carload lots.[15] He assumes all merchandising risks of his business, including shortages in transit, degradation, or breaking of coal in handling, and in addition provides sufficient storage facilities, stocks and delivery equipment to furnish, so far as lies within his ability, the kind or kinds of coal his customers want, when, where, and in such quantities as their needs demand. The services rendered include storage in bulk, absorption of losses in transit and in handling, and delivery in small quantities as needed. The retailer undertakes these functions for a gross merchandising profit, or, as it is termed in the trade, "gross margin" or "working margin," representing the difference between the cost of coal alongside his yard (including the price paid f. o. b. mines, plus freight) and the price at which the coal is sold.

Including the smallest dealers, retailers of coal in the United States number some 40,000 or more individuals, partnerships and corporations handling tonnages ranging from a few carloads to two or three millions of tons per dealer. In different sections of the country bituminous coal represents varying proportions of the

[14] "Wholesale and Retail Coal Trade," U. S. Coal Commission, p. 77.

[15] Types of retailers other than the yard-dealer described are worthy of note. They include team-track dealers in large cities who serve industrial and heating trade throughout the year, delivering from cars spotted on public team tracks; teamsters and peddlers who purchase from dealers having yards and furnish delivery services only, and finally, corner groceries and so-called "coal cellars" which handle coal by the bushel or the small paper bag to the poorest trade. The volume of tonnage handled by dealers having no yards of their own is small in comparison with that handled by dealers having yards.

total tonnage handled, but in general represents somewhat more than half of the total retail tonnage, estimated roughly at 125,000,000 tons annually.

Combinations of coal retailing with other more or less seasonal businesses, such as ice, lumber, building materials and grain, produce and live stock shipping, are general in both city and country trade. Retailers engaged exclusively in the coal business are most often located in large cities, where year-round volumes of trade sufficient to support their activities can be developed.

The retail trade, too, has its "snowbirds" in the form of individuals who, having no yards of their own, buy and deliver from team tracks only whenever there is an opportunity for profit, and co-operative buying clubs or associations that buy and deliver a car or, at most, a few cars for their members. Retailers object through their trade associations to the activities of such factors in the trade, claiming that they reduce the established dealer's tonnage, thereby resulting in higher costs to the established dealer and higher prices to consumers who are dependent upon him.

Elements in retail prices. The price paid by the consumer for the ton of coal delivered by the retailer covers the price paid to the operator, the wholesaler's margin, if a wholesaler intervenes between the mine and the retailer, the freight from the mine to the retailer's yard, and finally the retailer's margin to cover his unloading, yard and delivery expense, losses in transit, and, in case the coal is forked or screened, to remove fine sizes, any loss from selling the fine coal for less than cost at the mine, freight and handling costs, and finally the retailer's net profit.

The problem of retail costs. This problem is not a simple one. Services rendered vary widely for different dealers, being most numerous and most expensive for the city dealer, who, to meet exacting demands of his trade, screens or forks all prepared sizes to remove fine coal and provides expensive delivery service, even in some cases including wheeling or carrying the coal across lawns and trimming it back in bins, and least numerous and least expensive for the small country dealers, whose farmer customers provide their own delivery service, even to shoveling coal from the

dealer's bins to their wagons. Variations in efficiency of business management and in methods of handling coal may cause wide differences in costs of dealers doing business under essentially the same conditions.

Dealers find the accurate determination of two items of cost most difficult. These items are shortages or losses in transit, and degradation or breaking down of coal into fine dust or screenings in handling. The dealer pays for coal on the basis of car weight at the mine. If he believes that a car contains less coal than is shown on the invoice he may have it reweighed at the nearest track scales, the expense of reweighing being borne by the railroad in case there actually is a shortage, and by the retailer in case none is shown. Reweighing delays delivery and may entail additional expense. Consequently, it is resorted to only in cases where shortages obviously exist. For smaller shortages dealers obtain no check except their own scale weights by the wagon or truck load, and then only in case detailed records are kept, making possible accurate checks when inventories are taken or yards are completely empty. Few dealers keep the necessary records for such checks, hence shortages are guessed at rather than definitely known. On 286 cars of bituminous coal reweighed by the Indiana Retail Coal Merchants' Association during 1923, the actual shortage in weight was 7.76 per cent.[16]

Degradation occurs only on prepared sizes of coal, such as lump, egg and nut, representing only a part of the coal handled by most dealers. It does not affect any run of mine or screenings handled. It is largest for friable bituminous, and least for anthracite coal.

Fine sizes removed from prepared sizes often are transferred to screenings bins without weighing, and are sold along with screenings purchased by the carload. The prices received often do not cover the original purchase cost and handling expenses for the degraded coal, which was originally paid for as prepared coal. As an item of retail cost loss in value of coal by degradation is also more often guessed at than definitely known.

Finally, the majority of retailers conduct comparatively small

[16] "Wholesale and Retail Coal Trade," U. S. Coal Commission, Report L, p. 87.

businesses, without any special business training or accounting knowledge, Consequently, the books of most dealers are kept, at best, on a double entry basis, with no special attempt to segregate the results for the coal business from those of other businesses conducted. Large dealers, particularly those handling coal exclusively, whose tonnages are sufficient to warrant the expense of detailed accounting, often have accurate cost systems, but the Coal Commission found that in general the retailing of coal is conducted by thousands of retailers on a haphazard, rule-of-thumb basis, rather than on a basis of definitely known cost.

Retail margins. Retail gross margins, representing the difference between the cost of coal f. o. b. cars at the dealer's yard, and the price at which it is sold, were found to differ widely in different parts of the country and for different types of trade served. Margins of city dealers rendering the greatest delivery service were largest, and those of country dealers, rendering the least service, were smallest. Margins on coal sold to consumers who provided their own delivery were generally from $.50 to $1.00 per ton less than those on coal delivered by the dealer, except in the Far West, where the reduction in some cases was as much as $1.50 per ton. The amount of reduction made appeared to be determined more often by custom than by the dealer's actual cost of teaming and delivery.[17]

In general the margins reported by the majority of dealers throughout the country ranged from $1.75 to $3.00 per ton for bituminous coal. The lowest margin was 25 cents per ton, reported by a Pennsylvania dealer in 1922, and the highest was $5.90, taken by a Texas retailer in the same year. In general the margins taken on prepared sizes of bituminous were slightly larger than those taken on run of mine.[18]

Average margins, investments and profits. The Coal Commission sent schedules requesting information regarding investments, costs and profits for the five-year period, 1918 to 1922, to over

[17] "Wholesale and Retail Coal Trade," U. S. Coal Commission, Report L, p. 46.

[18] "Wholesale and Retail Coal Trade," U. S. Coal Commission, Report L, p. 46.

8,000 retailers throughout the country. About 6,000 of these schedules were returned, of which over 5,000 contained usable information for one or more years, and about 1,000 contained information for the full five years. Lack of time and personnel made it impossible to complete the tabulations of all five-year schedules. Those for 273 companies engaged exclusively in the

TABLE 19

*Retail tonnages, average margins, profits, investments and returns on investment for representative dealers in the Central and Mountain and Pacific states territory (predominantly bituminous)**

YEAR	TONNAGE	AVERAGE MARGIN PER TON	AVERAGE NET PROFIT PER TON	AVERAGE INVESTMENT PER TON	RATE OF RETURN ON INVESTMENT
Central states (95 companies)					
					per cent
1918	2,248,856	$1.683	$0.317	$1.636	19.4
1919	2,043,588	1.912	.320	1.913	16.7
1920	2,074,389	2.404	.456	2.065	22.1
1921	1,834,779	2.097	.218	2.515	8.7
1922	1,945,141	1.985	.280	2.336	12.0
Mountain and Pacific states (15 companies)					
1918	204,878	1.404	.127	1.357	9.3
1919	198,757	1.627	.226	1.384	16.3
1920	222,872	1.733	.313	1.349	23.2
1921	147,892	1.896	.010†	2.112	0.5†
1922	156,606	1.881	.144	1.976	7.3

* Compiled from "The Wholesale and Retail Coal Trade," United States Coal Commission Report L., Retail Section Table 2 facing page 53.

† Loss.

retailing of coal were completed and were used as the basis of the Commission's discussion of retail costs and profits.

Since practically every dealer handles both anthracite and bituminous coal it is impossible to select a group of dealers handling bituminous only. In certain sections of the country, however, the tonnage is predominantly bituminous. Of the various sections, the Middle West is probably the most representative of the bituminous trade.

For this section 95 dealers, handling approximately 2,000,000 tons in each of the five years, realized average margins ranging in different years from $1.68 to $2.40 per ton. Average retail expense ranged from $1.39 to $1.99, and net profits per ton ranged from 21.8 cents to 45.6 cents in different years. On total investments ranging from $1.64 to $2.51 per ton in different years, these profits netted returns ranging from 8.7 per cent to 22.1 per cent. All profits and rates of return were computed before payment of Federal income taxes. In four of the five years returns on total investment ranged from 16.7 to 22.1 per cent.[19] These rates of return, it will be noted by comparison with the table on page 123, were less, except for the year 1921, than those of bituminous wholesalers who did not physically handle the coal they sold. Table 19, page 133, shows the tonnages, margins, investments and profits of dealers in the Middle West, Mountain and Pacific States region, whose tonnages are predominantly bituminous.

Conclusion. The Coal Commission recognized that, even making due allowance for the necessity of maintaining sufficient retail facilities to meet the peak demand of winter, facilities for retailing bituminous coal are considerably overdeveloped; that the trade is generally highly competitive and that generally it is the most efficient firm that succeeds. The Commission took the position that where artificial price control, maintained by collusive action on the part of the retailer, is absent the competitive nature of the retail trade generally makes regulation of bituminous margins and prices unnecessary except in times of emergency shortage, and that regulation, when necessary, should be applied locally and should take the form of limitation of margins rather than the fixing of prices.

[19] "Wholesale and Retail Coal Trade," U. S. Coal Commission, Report L, Retail Table 2.

CHAPTER IV

How the Miners Live

To answer the question, "Are the miners getting a decent living?" it was necessary to determine the economic status of the mining population. Rates of pay vary widely from district to district and even from mine to mine; the opportunity for employment varies; operators claim that the miners do not take full advantage of the opportunity to work when it is offered, and so the Commission measured absenteeism and labor turnover—all in order to test the actual earning power of the miners. The cost of living had to be determined, together with retail prices of food, clothing and the other necessities of life in the mining regions and, finally, family incomes and actual expenditures were examined.

Chapter IV takes up the last four of these subjects. It also includes a section on accidents and health.

Four investigations were made by the Commission to secure information about living conditions: For data on physical environment and community resources a staff of field agents investigated 880 communities—713 company-controlled and 167 independents; for the characteristics of the mining population a tabulation was made from the schedules collected by the Bureau of the Census in 1920; for sanitary surveys the Commission turned to the United States Public Health Service, which made investigations of 123 communities—64 of them company-controlled and 59 independents; for information about the cost of living, retail prices of commodities, rental rates, etc., field studies were made in selected districts.

The engineers of the Bureau of Mines reported to the Commission on mine safety.

1. The bituminous mine-workers and their environment

Make-up of the bituminous mine-working population. Who the men are who work and live in the bituminous coal fields of the United States, how many of them live in urban centers and still

pursue the occupation of mine-worker; how many are native white or colored; how many are foreign born and whence they come—these and many other important questions are answered at length in the reports of the Commission.

Of the half million and more bituminous coal mine-workers throughout the United States only a little more than a fifth live in incorporated towns with a population of 2,500 or over. But this proportion varies from 47 per cent in Illinois, where many towns originated before coal mining began, to 6 per cent in West Virginia, where bituminous coal mining often means pioneering, and generally involves living in company-controlled communities.

Nearly 60 per cent of the bituminous mine-workers are native born, white, another 8 per cent are colored natives, and slightly less than a third are foreign born; Italy, Austria, Poland and the British Isles, in the order named, furnishing the largest number of recruits to the industry. These are the figures for the half million and more bituminous mine-workers, but they do not show the prevailing racial characteristics in the various coal regions. In Pennsylvania, for example, over 55 per cent are foreign born, and an insignificant number are native colored. In Alabama less than 4 per cent of the mine-workers are foreign born, and 53 per cent are colored natives. The native white mine-workers predominate in West Virginia, Indiana, Ohio, Illinois and in the other central western States.

Nearly 70 per cent of the foreign born bituminous coal mine-workers had been in this country ten years or more in 1920, and over 90 per cent had been here five years or more. While the proportions of foreign born among the mine-workers in each section of the country differ conspicuously, the proportion in each section whose residence in the United States exceeds five years presents few marked variations. On the other hand, the numbers of foreign born who have been in this country fifteen years or over differ sharply in the several coal States.

Twenty-six per cent of the total number of foreign born mine-workers in 1920 were naturalized, 16.9 per cent had taken out first citizenship papers, and 51.7 per cent were alien (the status of 5.2 per cent not being reported). Here again, figures for all the

mine-workers taken together fail to represent the civic status of the foreign born engaged in the bituminous mines of Illinois, where 42 per cent were naturalized, 21 per cent had first papers and 31 per cent were alien; and of Pennsylvania, where 22.6 per cent were naturalized, 14.1 per cent had first papers, and 59.7 per cent were alien. In West Virginia less than 10 per cent of the 18,500 foreign born mine-workers were naturalized, 9.2 per cent had taken out first papers, and 74.8 per cent were still alien in 1920, the status of the other 6 per cent being unknown.

From a social and civic point of view the figures on literacy for the bituminous mine-workers as a whole and for those in each of the sections shown separately are encouraging, as 87.9 per cent of the total both read and write, the per cent ranging from 83.8 in West Virginia to 96.9 in Indiana. In the light of mining hazard, however, the 11 per cent of the total who neither read nor write, ranging from 2.8 per cent in Indiana to 14.9 per cent in West Virginia, assumes significance. Of the total foreign born from other than English speaking countries, 22.8 per cent neither read nor write and 12.7 per cent do not speak English, the percentages varying somewhat in the several sections shown separately.

Approximately 62 per cent of the bituminous coal mine-workers, whether native white, native colored or foreign born, maintain homes and over 95 per cent of all those maintaining homes are, or have been, married men. Over 17 per cent, chiefly single men, are living with parents or relatives, and 20 per cent, largely single men, but many whose wives are not present, are boarding or lodging. Disregarding the small numbers of colored in western States and the foreign born in Alabama, the proportions maintaining homes in sections shown separately, deviate substantially from the totals for the entire bituminous coal area, the greatest range being from 50 per cent, for foreign born in West Virginia to 68 per cent, also for foreign born, in Illinois. The number of native whites in West Virginia maintaining homes is nearly 62 per cent and in Illinois it is 64 per cent.

In 70 per cent of the homes of the native and foreign born mine-workers throughout the bituminous coal fields, taken as one group, there are not more than five members in the family, including in the term the parents—or those standing in the place of parents—

and the children. In approximately 11 per cent there are eight or more members. In the totals for native and foreign born, however, the differences among the races are submerged, as in 85 per cent of the families of the colored mine-workers there are five members or fewer, and the same limits prevail in approximately 73 per cent of the native white families. In 61 per cent of the homes of the foreign born, on the other hand, there are not more than five members and in nearly 15 per cent of the homes of the foreign born there are eight or more members. This racial influence in size of families is reflected in the totals for States having marked differences in proportions of native or of foreign born. The totals for Pennsylvania show 62 per cent of the families with a membership of five or less. In West Virginia, where the native born mine-workers predominate, the percentage of families having no more than five members rises above 71. A considerable number of the colored mine-workers, wherever found, appear to be maintaining homes for themselves alone, and few of them are reported as having large families.

In nearly 70 per cent of the families of the bituminous mine-workers maintaining homes, the mine-worker is the sole breadwinner. In the case of the native born white, he is sole breadwinner in over 73 per cent of the homes, and in 61 per cent of homes of the foreign born. The families which have three or more breadwinners—that is, two or more beside the mine-working head of the family—are less than 9 per cent of the total number maintaining homes. In the sections shown separately, the proportion of homes whose mine-working heads are sole breadwinners varies with the variations in the proportions of native white, colored and foreign born—the sole breadwinning mine-workers forming the largest group where the native born predominate—that is, Illinois, Indiana, Ohio, West Virginia and Alabama.

Such are the outstanding facts concerning the personnel of bituminous coal mine-workers. For the wealth of illuminating detail the reader must turn to the Commission's full report. But even this brief summary shows that most of the men in the mines throughout the bituminous coal regions as a whole are men with family responsibilities, with the added claims which such respon-

sibilities create for a reasonable measure of healthful community life; that they are, indeed, predominantly "family men," and are in fairly close accord with prevailing national standards in the matter of size of family and of the obligation of the head of the household to serve as sole or chief breadwinner; that when the coal companies are operating in fields remote from normal centers of population they must, in a majority of cases, provide quarters not only for the mine-workers, but for their families.

Types of communities in which bituminous mine-workers live. The need for housing and community provision does not rise or terminate abruptly, but increases with the distances and diminishes with accessibility to self-controlled centers of population. Only in sections which have a large proportion of foreign born are relatively large numbers of mine-workers living in company-controlled communities, when proximity, or transportation facilities to normal American communities would seem to render needless any housing provision on the part of the company. The figures in the Commission's report, therefore, showing that approximately half of the bituminous coal mine-workers are housed in company-owned dwellings, do not represent a uniform condition throughout the several coal regions. As a matter of fact the living conditions in this respect in the eastern and central western bituminous coal fields, where 90 per cent of the mine-workers live and labor, present three distinct aspects.

The first of these is presented by the bituminous coal mining communities of Pennsylvania and Ohio. Here the communities were fairly well settled before mining operations began, and numerous civically-controlled communities flourish throughout the coal mining regions; yet more than a half of the mine-workers in Pennsylvania and nearly a fourth of those in Ohio are housed in company-owned dwellings.

The second aspect is presented by the mining communities in the coal fields of the Southern Appalachian area, that is, West Virginia, eastern Kentucky, Tennessee, Virginia, Maryland and Alabama. Because the coal seams in these States run into places remote from normal population centers, much larger numbers of mine-workers—two-thirds to four-fifths—are living in company-

controlled communities, upon which, as a consequence of their remoteness, the mining population must depend largely for the necessaries and the accessories of civilized life. Reports from the bituminous coal fields of the Rocky Mountain and the far western States, where the other 10 per cent of the mine-workers live, but where resources did not permit the field agents of the Commission to go, show the same conditions, apparently, as over half of the mine-workers in those fields are living in company-owned dwellings.

The third aspect is found in Illinois and Indiana and also, to a large extent, in Kansas, Missouri and Iowa. In the bituminous coal regions of Illinois and Indiana, where agriculture and industry have long ago brought into being centers of self-governing populations, where transportation facilities are ample and where native born mine-workers far outnumber the foreign born, less than 9 per cent live in company-owned dwellings. In the coal fields of Kansas, Missouri and Iowa, where there are fewer population centers than in Illinois and Indiana, 18.5 per cent of the mine-workers are in houses provided by the coal companies.

As a whole, the Commission's figures show that the nearest towns for three-fourths of the bituminous coal mine-workers living in company-owned houses are places of less than 2,500 people, and that but 12 per cent are within five miles of incorporated towns of 2,500 or over. In other words, nearly nine-tenths are more than five miles from the resources of community life and the institutions of civil liberty that characterize the ordinary American urban center. In settled regions distances are shrunk into accessibility by good roads and transportation facilities. In new regions distance spells isolation, and distant coal mine operations characterize the new regions.

Physical environment. In view of the large proportions of bituminous mine-workers who are remote from independent self-governing communities, it is evident that available facilities for family and group life often depend upon the coal operator and reflect the standards which *he* sets up for the men—and for the wives and children of the men—who dig his coal. What sort of standards he sets up depends in turn upon the difficulty of attract-

ing and holding labor, upon the prosperity of the mine, and upon the importance which the operator's obligations toward the men assume in his mind. The conditions as to labor supply vary sharply; so does the degree of mining prosperity, and one would expect to find among operators a wide range of differences in social vision.

What the self-governing communities offered as pattern to operators. But a fairer judgment can be passed upon the extent to which bituminous coal operators are discharging their obligations to those mine-workers who are dependent upon coal companies for housing and community facilities, if some facts are available which reveal the plane upon which bituminous coal mine-workers can live in independent communities located in the soft coal regions. For this purpose there were included in the Commission's study of living conditions, 167 self-governing communities, ranging in population from less than 1,000 to over 50,000. In these towns live not far from 60,000 men engaged, according to the 1920 Census records, in the "extraction of minerals." As all the 167 towns are located in the bituminous coal fields most of the men so classified are bituminous coal mine-workers. The entire number constitutes approximately 27 per cent of all the men living in the same towns.

The Commission's general summary of data bearing on the independent communities is, in the main, as follows:

Approximately 15 per cent of the 167 towns or cities have piped water throughout, though 57 per cent have waterworks. While waterworks systems in independent towns do not mean necessarily running water in the mine-workers' homes, the systems are installed with special reference to the welfare of the community members and running water service in the house is largely a matter of the occupant's ability to pay for, and his inclination to have, such convenience for himself and his family. Seven per cent of the 114 towns of less than 2,500 population had all houses served with piped water, though nearly 40 per cent had waterworks.

Over half of the 167 independent towns have sewer systems, though only 4 per cent of the communities are completely equipped

with sewer mains. The report of the United States Public Health Service reveals a low standard in the method of sewage disposal in communities of 1,000 or under.

Ninety-three per cent of the 167 independent communities, and 90 per cent of those having populations under 2,500, have public lighting systems.

One hundred and forty-seven of the 167 towns have resident physicians, all the 20 which have none being in the group of communities having fewer than 2,500 people. Hospitals are to be found in 44 communities, 8 of the smaller towns being so provided. In 31 communities the services of trained nurses are available. Dentists are practicing in 115 towns, 62 of which are in the group with less than 2,500 population.

Of the 140 towns from which definite data on the length of school term and the teaching force were secured, all have grade schools in session for terms of eight to nine months. The number of pupils per teacher was 44 in schools for white children and 39 in schools for colored children. Seventy-eight of the 167 communities have high schools and 20 others have combination grade and high schools. Thirty-one have public libraries and 34 have reading rooms. All but seven communities have churches.

Except for towns of 10,000 population or more, recreation provisions in the great majority of communities are confined to ball fields, pool rooms, moving-picture shows, church clubs and fraternal societies. Twenty-eight communities have rest rooms and in 38 there are public parks.

What the bituminous coal operators provide for mine-workers living in company-controlled communities. The Commission's report on "Bituminous Coal Mine-Workers and Their Homes" gives careful consideration to the difficulties of natural location often confronting the operator who must provide housing for his men and their families. The report also deals with the subject of "restricted life of the mine" in assembling data bearing on community resources, facilities and general upkeep in company-controlled towns. These matters cannot be discussed here, but the reader should bear in mind that they *are* factors in the living conditions. On the other hand, a careful analysis of the

Commission's report will disclose the fact that difficulties of natural location and restricted life of the miner did not always stand in the way of creating and maintaining satisfactory conditions for family and community life, or that such difficulties and restrictions were always, or even in the main, accountable for fatal defects in the equipment and material environment essential to health, comfort and contentment. The outline of the material conditions which surround the bituminous mine-workers and mine-workers families living on coal company properties may be traced in a few paragraphs.

In the 713 company-controlled communities included in the Coal Commission's study there were approximately 71,000 company-owned family dwellings, 95 per cent of which, as might be expected, were of wood. Three to five rooms constitute the prevailing mine-worker's home on company-controlled properties, though of course there are one and two-room shanties and houses with six rooms or more. Over two-thirds of the 71,000 family dwellings were finished on the outside with weather board, usually nailed directly to the frame with no sheathing other than paper, and sometimes not even that. Board and batten—the cheapest type of construction—formed the outside finish of over 25 per cent of the dwellings. The houses usually rest on post foundations with no cellars, though the double houses—particularly those in more rigorous climates—often rest on solid foundations and occasionally are provided with excavated cellars. Wood sheathing forms the inside finish of half the houses, and plaster finishes the inside of another 38 per cent. Over two-thirds of the roofs are of composition paper. The character of structural materials, of inside and outside finish, the type of roof and of foundation, are not the distinguishing features of "good" and "poor" company-controlled communities, as the diversity in these matters is not as great as the diversity in general living conditions found throughout the coal regions.

Less than 3 per cent of the 71,000 company-owned dwellings in which the bituminous coal mine-workers live have bathtubs or showers. Three per cent have inside flush toilets. Less than 14 per cent of the 71,000 dwellings have running water inside.

though nearly 61 per cent of the 713 company-controlled communities have water-works systems. Two-thirds of the houses have electric or gas light.

Company provision for recreation and amusement in the majority of communities is so meager as to be negligible.

The educational facilities which, in law, are usually a matter of state rather than company responsibility, are not always provided by the state or county boards of education alone. Sometimes the provisions are made by the companies. In some cases the funds are derived from a special school tax deducted from the mine-workers' wages. In others the company-controlled communities are so near to independent towns that where there are adequate transportation facilities the schools of such towns are available to the children of mine-workers who can afford it.

Medical service is within reach of practically all of the company-controlled communities, but one physician sometimes serves several communities, and is therefore unable to respond promptly to calls. Dental service is within practicable reach of only a very small minority of the company-controlled communities. Hospital and trained-nurse service, except in model communities, is not within convenient or even reasonable distance in view of the conditions of the roads and of the limited transportation facilities.

Churches or buildings available for churches are to be found in a majority of the company-controlled communities. Frequently the same structure serves more than one denomination. In some cases the mine-workers have raised the money to build the church, the companies contributing to the funds.

While the above summary affords a general idea of the facilities and resources within company towns, as a whole it does not reveal the range of conditions in individual communities. To get this individualized picture of standards prevailing in company-controlled communities the Commission staff used, in addition to the customary detailed schedules, a scoring schedule. This schedule was analogous to the one adopted by the United States Public Health Service, and was worked out in conference with the Public Health Service officials who made expert health and sanitation surveys for the Commission.

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In the score card used for rating living conditions eight factors were considered: housing, water supply and distribution (with reference to all household and family requirements); sewage and waste disposal; community layout (that is, the use made of any advantages offered by the "natural location," which was rated separately, as natural location is not within the operator's control); food and merchandise supply; medical and health provisions, and provisions for recreation, for religious worship and for education. Each of these factors was subdivided and scored on the basis of 100 possible points and then given a fixed weight in the total rating. The smallest possible margin was allowed to the opinion or impression of the agents, as "points" stood for the existence of definite facilities or advantages described in the instructions. This method of scoring does much to correct an unconscious but common error of giving undue weight to fresh paint and general appearance at the expense of other factors equally or more important, but not so obvious. As the Commission's report points out, it is not intended by this comment to "belittle the importance of paint and orderliness in the upkeep of premises. It is only to point out that the scoring method gives these factors due, but not undue, weight in a total rating." Finally it should be kept in mind that there are no lines of sharp demarkation between the good and bad communities, the good merging into the very good and best on the one side, and into the fair, poor and worst on the other. Nor do the communities individually show the same level of merits or defects in all the matters that go to make up living conditions. Some have good houses but poor water supply; others good roads, clean properties, but poorly built houses or inadequate methods of sewage disposal. All of these irregularities appear in the final scoring of the communities. Restricted space forbids further description of the scoring methods used and explained in detail in the Commission's report. Enough has been said, however, to lend significance to the outstanding fact disclosed by the method, viz: that of 713 company-controlled communities, 66, or 9 per cent, scored 75 points or more in general community conditions for which the operators are morally if not legally responsible; 82, or 11 per

cent, scored under 50 points and 80 per cent fell between these two ratings.

Health and sanitation as reported by the United States Public Health Service. The above ratings were concerned primarily, as stated, with the general living conditions of the 713 company-controlled and 167 independent mining communities in the bituminous coal fields. To supplement these data the United States Public Health Service made expert health and sanitation surveys in 64 company-controlled and 59 independent bituminous coal-mining communities. While many subjects were considered, the factors which were regarded as of dominating importance in the Public Health ratings were the supply of drinking water; disposal of human excreta; control of fly prevalence; protection of foodstuffs and disease-prevention activities.

The detailed and summarized reports submitted by the Public Health Service to the Commission contain a fund of singularly interesting, instructive and constructive material. Concerning the water supply the report says:

> In analyzing the situation with regard to provision for safe water as well as for other sanitation, it is apparent that little use has been made of existing health agencies in solving the problems confronting the coal patches. Neither the State boards of health nor private waterworks engineers have been consulted in an effort to secure health protection. The easiest means of securing water, namely, by digging shallow wells, has too frequently been resorted to. . . . The retention of a competent engineer would solve many of the difficult problems at present confronting some of these towns.

As a measure of improving the water supply and insuring its adequate protection, the Public Health Service recommends that the responsibility be placed definitely upon some one competent official. Concerning sewage disposal the Public Health Service says:

> There can be no question as to the general backwardness of the bituminous coal patches as regards satisfactory methods of disposing of human excreta. In many mining camps and towns too it is apparent that the importance of the subject is but partially realized. Moreover, it is plain that little progress has been made since the establishment of

many of the towns. . . . Lack of proper sewage disposal methods may be ascribed to careless planning, failure to enlist the services of experts and inadequate knowledge of health safeguarding. . . . Sanitary sewer systems should be provided wherever the economic conditions are favorable. . . . All privies, cesspools and other makeshifts (should be) abolished as soon as connections are made.

In the matter of fly prevalence the Health report says:

The fact that manure is a fly-breeding material of first importance is practically unrecognized in the places surveyed. Ordinances or requirements for the systematic and frequent removal of manure are conspicuously absent. . . . Screening against flies may be said to be generally inadequate.

Considerable carelessness, says the Public Health Service report, in protecting foodstuffs from dust, flies, and promiscuous handling is noticeable in many coal patches and larger communities. . . . It must not be inferred that the conditions cited are unusual. Quite on the contrary it may be stated that there are excellent stores in many of the places surveyed. The majority of the company stores . . . are maintained in good order.

Fully as important as the question of the protection of foodstuffs in community stores is that relating to the preservation and protection of food within the separate homes. . . .

Few communities have ordinances or requirements governing the production and handling of milk. Apparently the subject has received scant attention in any but the larger cities.

In the matter of disease-prevention activities the Health report sums up the conditions thus:

Control of disease carriers and communicable disease contacts appears to be an unknown art. When health officers are employed their principal work appears to consist of making inspections for the location of nuisances and then proceeding to abate the objectionable conditions.

In concluding its report on the health and sanitation in bituminous coal fields, the Public Health Service says:

. . . While the general sanitation of coal patches is relatively low . . . the situation is not without definite possibilities for improvement. The absence of an official agency to which the company or municipal official may turn is one of the glaring deficiencies of the present situation. To supply this need it is suggested that a division of community sanitation in the Bureau of Mines, Department of the Interior, or a similar division in the Public Health Service, could render extremely valuable service.

This recommendation the Commission adopted and incorporated in its report to the President and the Congress.

Terms upon which mine-workers live in company-owned houses. It is obvious that when the normal labor supply of city or town is out of the operator's reach, his housing facilities, whether good or bad, become such an indispensable factor in securing labor that tenure of company houses by mine-workers must be coincident with employment in the company mine.

This fact should be kept in mind when passing judgment upon the conditions under which company-owned houses are occupied by mine-workers and their families. These conditions can be stated substantially in the words used in the Commission's report on the subject. The rentals are lower for company-owned than for non-company-owned houses. The occupant of the company-owned house gets his fuel and frequently his light at a markedly lower cost than do other wage-earners. Usually he pays nothing for water, even though it is piped to his premises. Medical service for himself and his family is available at small cost when compared with the expense of such service under ordinary circumstances. No accurate measurement of the value of these comparative advantages can be made, however, unless there be taken into consideration also the comparative terms under which a mine-worker lives in a company-owned or non-company-owned house. However obvious and urgent is the coal company's need to keep its houses for its labor, it does not obscure or lessen the importance of the status of the mine-worker occupying a company house as compared with his status when renting a house under the ordinary tenancy laws, which in every State afford him and his family security of tenure, days of grace before eviction even for proven breach of contract, and which insure to him an American citizen's control over his own premises during his legal tenure.

There are submitted in the Appendix to the Commission's report copies of mine-workers' house leases used by coal companies in West Virginia, Pennsylvania and Ohio. Though they differ in phraseology, they do not differ materially from one another in provisions, except that some are a little more explicit as to the

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company's rights, and others more general in abrogating the claims of ordinary tenancy. These documents show that the lease terminates automatically whenever the mine-worker ceases, *from any cause whatsoever,* to work for the coal company.

The company may legally put the mine-worker and his family out of the house at the termination of the lease without prejudicing claim for any rental arrears and without incurring liability for damage resulting to the mine-workers' belongings through eviction.

The company may pay itself out of the mine-workers' wages for rent due, also for damages done to the property. According to some leases, the company may also withhold all unpaid wages at the termination of a lease until the premises are surrendered. According to others, the company may retain permanently $2.00 for each day the premises are occupied by the mine-worker or his family after the termination of the lease. (The regular rentals of the company-owned houses range from $6.00 to $11.00.)

The company reserves the right to enter and inspect the premises at any time and to make and enforce rules and regulations affecting the streets or roads upon which the premises abut.

The mine-worker, according to some leases, must not entertain or harbor upon the premises persons objectionable to the company. Some leases stipulate that neither lodgers nor boarders can be taken into the mine-workers' family without the operator's consent, unless such boarders or lodgers work for the company. Other leases provide that the mine-worker's rights in the premises are only those of ingress and egress for himself and the members of his immediate family. Some stipulate that the lease does not create the relation of landlord and tenant and commit the lessee to a waiver of the protection of all laws covering tenant's rights.

Quite aside from the moral right or wrong of these provisions and quite apart from the question as to whether the provisions were inserted in the interest of law and order or to insure a more effective control of labor supply, the legal insecurity of house tenure, and the marked limitations upon control of premises during tenure, are factors which cannot be ignored when com-

paring values received for rentals paid for company-owned and for non-company-owned houses. The insecurity of tenure is a particularly important factor in view of the provision that when a mine-worker loses or gives up his job "for any cause whatsoever" he loses the right to occupy his house from the day he ceases to work. A sudden altercation with the mine boss may end in discharge and simultaneous loss of dwelling. Some operators contend that these provisions are "mere forms" and of no importance. The contention is in conflict with the declarations as to the need of inserting the provisions. However, no statement concerning company leases is complete that does not make clear these facts, namely, that none of the agents engaged in this investigation reported the eviction of a man who ceased to work because of illness; that it was usual not only to let the mine-worker remain in the house during slack work, but that frequently the rent was allowed to run until better earnings permitted the mine-worker to catch up with expenses, and in some cases the rent for such periods was never collected, and that families whose men had been killed in the mines were sometimes allowed to live on indefinitely in the company houses. This policy did not apply to cessation of work for other causes, such as voluntary withdrawal or discharge. Furthermore, whatever the company does in time of sickness or other misfortune is a measure of mercy or of benevolent tolerance granted to the mine-worker. It is not a right which the mine-worker can claim for himself and his family under any tenancy laws of the State.

It should not be overlooked that in this insecurity of tenure the wife and children of the mine-workers are affected as much as he is, if not more. The knowledge that the two precious eggs—the job and the family shelter—are in one basket and that at any hour of the day the husband may come back with both broken is a constant and grim companion whose menace to herself and her children the mine-worker's wife is powerless to forestall.

2. COST OF LIVING AND PRICES

"Wages adequate to maintain a reasonable standard of living." This economic principle embodies the modern consciousness that

spending is as important a part of living as earning. The wife as manager of the family income, the husband as earner of the family income, are jointly responsible for the family comfort and well-being. The wife is usually the dispenser of earnings in mine-workers' families as in other wage-earners' families, but in half the bituminous mine-workers' families the character of the responsibility borne by the wife as spender of earnings is materially altered because half of these mine-workers' families live in company patches.

The mine-worker's wife living in an independent mining town in Illinois or Indiana is accustomed to receive her husband's semi-monthly pay envelope and to apportion its contents as best she can. But the mine-worker's wife living in a company-owned patch in West Virginia or Alabama is given a pay envelope from which have been deducted the purchases made at the company store, the rent for the company house in which the family lives, the electricity used to light the house, the fuel burnt for cooking and heating, the regular charge for which medical attention is received when needed and money advanced by the company.

The mine-worker's wife is thus often relieved of much of the responsibility of making current living expenses equal income. For it is the task of the mine company's bookkeepers to take care that her debts to the company are not larger than her husband's earnings warrant. Under this system, of course, the painstaking housekeeper can figure her budget in advance with greater accuracy than in independent towns, where electric light bills and fuel bills vary, where doctors' fees make unexpected inroads on resources. Under it she is still free to secure food, clothing and other merchandise from sources other than the company commissary. But a system which *permits* shifting most of the burden of spending the family income results in enervation. It is so much easier to go to conveniently located company commissaries and to succumb to the prices asked in such depots than it is to shop around to locate the store which charges lowest prices; it is so much easier to be free to spend for extras what remains in the pay envelope than it is to be held accountable for payment of current bills.

Mine company stores. So it is that mine company stores flourish in undeveloped regions in spite of higher prices than are charged in many independently owned and operated stores in the same localities. In the New River District and in the Kanawha District of West Virginia the Commission secured prices on 54 food articles equalling 96 per cent of the total quantity of food purchased in 1922 in the scheduled communities. When food prices charged in company stores and food prices charged in independent stores in each district were multiplied by the importance of the food in the year's local purchasing, the miner's family buying all supplies in mine company stores paid 4.2 per cent more for its food than did the family that patronized only the independent stores in each district. Ninety-eight mine company-owned stores and one hundred and forty-four independent stores serving approximately 51,000 people furnished the figures used in this comparison.

In Alabama the Commission secured food prices from 23 company-owned stores and 28 privately-owned and operated stores supplying approximately 20,000 persons. Had Alabama mine-workers' families purchased all the year's food supply at company stores it would have cost them *seven per cent more* than if they had purchased all supplies at Alabama mining town independent stores. Although the company store is frequently found in the coal regions of Pennsylvania, the State law making necessary separate incorporation of store and mining company causes store managers frequently to object to having their stores classed as "company stores." For this reason a comparison of prices of independently-owned and mine company-owned stores in Pennsylvania was not made. Ohio and Illinois, the two remaining States included in the price investigation, have relatively few commissaries.

The statement is commonly made that prices are higher in mine company stores because the goods carried are superior in quality. Information secured by the Coal Commission as to brands of package food carried indicated that the same brands were to be found on the shelves of independent stores as were on the shelves of company stores in the same locality. Beyond doubt

the company store has introduced into undeveloped regions as varied and as good a grade of foods as are to be found in city stores. But having accustomed the mine-worker's wife to certain brands and kinds of goods, independent stores are forced to carry the same goods in order to compete with company stores.

At first glance there appears to be every reason why company store prices should be less than those charged in independent stores. As pointed out in the Commission's report, such stores have many advantages in mining communities. They have the credit standing of the mine company; the major part of their trade pays in advance; whenever credit is extended the financial position of the family receiving it is definitely known; when employment of customers is to be irregular, the store is aware of the situation before it occurs and can regulate buying accordingly. The independent retailer, on the other hand, must do his business on a credit basis, counting on the miner's wife to pay him each semi-monthly pay day. If she does not pay, she has no property to attach nor will the coal company assume any responsibility.

On the other hand, independent stores are operated frequently as family concerns with no payment of salaries, whereas company stores are managed by a salaried man with salaried clerks. Consequently, operating expenses in company stores are higher than in many independent stores. Then again, a competent company store manager expects to make a profit for the mine company out of store operation, whereas the independent storekeeper hopes to make a comfortable living for his family.

Where competition exists between company and independent stores the company store attracts and holds customers by carrying a new and varied stock of supplies, by making the store the social center of the patch. The usual independent store, a small store at some distance from the patch and with little capital, can carry only the articles in most demand and, therefore, must use lower prices as its chief attraction.

There are still numerous mining patches in the southern Appalachian coal-mining region which are not connected with a public highway. Wherever this condition exists the coal-mining com-

pany must still see that food and other merchandise are made available to its mine-workers. There are numerous communities that have almost no inhabitants who are not dependent for a livelihood upon mining, directly or indirectly, so that irregularity of mine operation makes precarious the existence of an independent store with small capital. Until prosperous years at the mine have enabled independent storekeepers to establish credit with wholesalers who will carry them over the unemployment periods when miners' cash is not available, or until mining communities have a population not entirely dependent on mine operation, the company store will still be a necessary institution in undeveloped mining regions.

Prices in coal-mining regions. Prices on 90 per cent to 95 per cent of all food purchased were secured by the Commission from 720 stores in eleven mining districts serving a population of approximately 165,180 persons. For comparative purposes quotations of the same date (December 15, 1922) were secured from 130 stores in industrial cities near coal-mining regions. The kinds and quantities of food purchased during 1922 by 12,008 mine-workers' families were computed from store records in order that comparison of differences in cost of foods might be based upon the foods actually consumed in each region. Food prices were highest in the two West Virginia mining districts. Purchases of food in New River in 1922 cost 11.6 per cent more than if such purchases had been made in stores catering to wage-earners in Charleston, West Virginia, or Pittsburgh, Pennsylvania. The 1922 food purchases made by mine-workers' families in the Kanawha District cost approximately 5 per cent more than if such food had been bought in wage-earning sections of Charleston and 8.6 per cent more than if bought in similar sections in Pittsburgh. Cost of food in Alabama mining communities was also higher by 5 per cent than in Pittsburgh, but in this State the prices in mining regions did not differ from Birmingham prices. In the four mining districts of Pennsylvania the two mining districts of Ohio and the two mining districts of Illinois included in the study there was but slight variation in cost of food supplies, as will be seen on Chart 2.

The mining districts in these three States were made up either of independent mining towns or of mining patches within communicating distance of other industrial centers. It is obvious, therefore, that the cost of food is less in mining centers near other industrial towns.

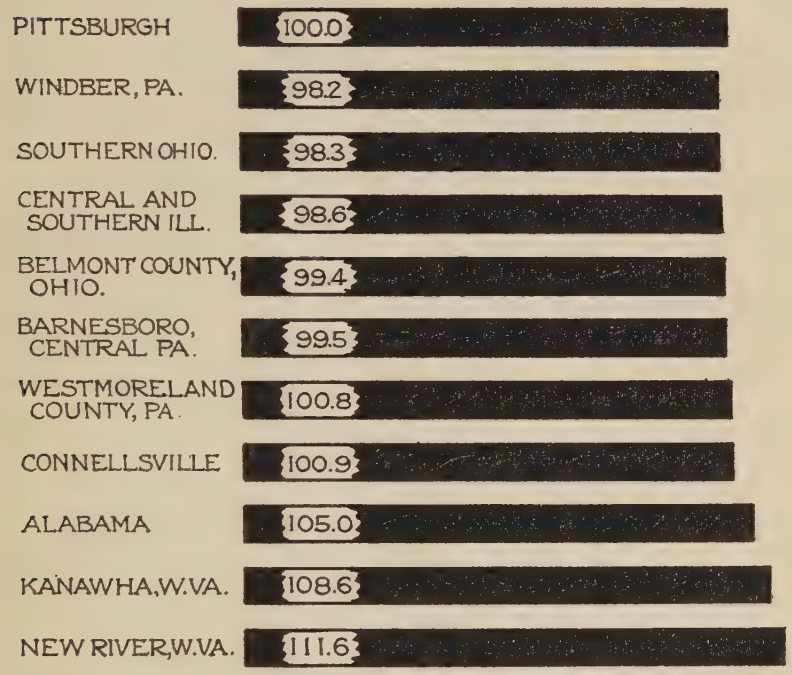

CHART 2. RELATIVE COST OF THE FOOD CONSUMED BY MINERS' FAMILIES DURING 1922, WHEN PURCHASED IN THE CITY OF PITTSBURGH AND IN TEN MINING DISTRICTS

(Cost in Pittsburgh taken as 100.0. Prices quoted as of December 15, 1922)

But if the cost of food decreases when mining districts develop independent community life, the cost of housing increases. Rentals were highest in Illinois, where the mining town has almost crowded out the mining patch. A four-room frame house, privately owned, without running water but with electricity brought a rental of $15 to $25 per month. Even mine company-

owned houses in Illinois rented for $12 and more per month. The prevailing rental in West Virginia and Alabama was $6 and less than $7 per month. In the Connellsville District of Pennsylvania a four-room house rented more frequently for $7 and less than $8, in the Westmoreland District, Pennsylvania, for $8 and less than $9, in the Windber District, Pennsylvania, for $9 and over per month. In Ohio prevailing rates for the four-room waterless, but electrically-lighted house, were $8 to $9 per month.

Information on clothing prices compiled by the Coal Commission indicated that there was not sufficient standardization in quality to make comparison of clothing prices of any value.

While the cost of electricity does not vary appreciably in mining districts and in industrial centers, coal can be purchased at a much lower price in mining communities. In West Virginia it is customary to charge the mine-worker a flat rate of $2 to $3 per month for which he can take all the coal he needs. Where coal delivered is sold by the ton the prevailing rate varies from $1 to $2 in the Connellsville region to $4 in the Illinois mining districts.

Amount spent by bituminous coal mine-workers' families in 1922. Employment conditions in 1922 were so varied in the several mining districts included in this section of the Coal Commission's studies that a comparison of moneys spent in 1922 in the several districts must give constant consideration to these differences. Unfortunately, no detailed statistics on employment are available for 1922. The record of purchases from month to month made by a mine-worker's family reflects, however, the changing financial condition and employment status of the mine-worker. (See Chart 3.)

With company-controlled communities the basic unit of many mining centers, it was possible to ascertain the more important expenditures of 12,000 families from sources of supply in 157 communities. Merchandise sales data were secured from all stores and mail-order houses serving single patches or groups of communicating mining patches. Mine company records furnished information on rentals, cost of water, light and fuel, as well as on

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AT THE MINE MOUTH AFTER A DISASTER

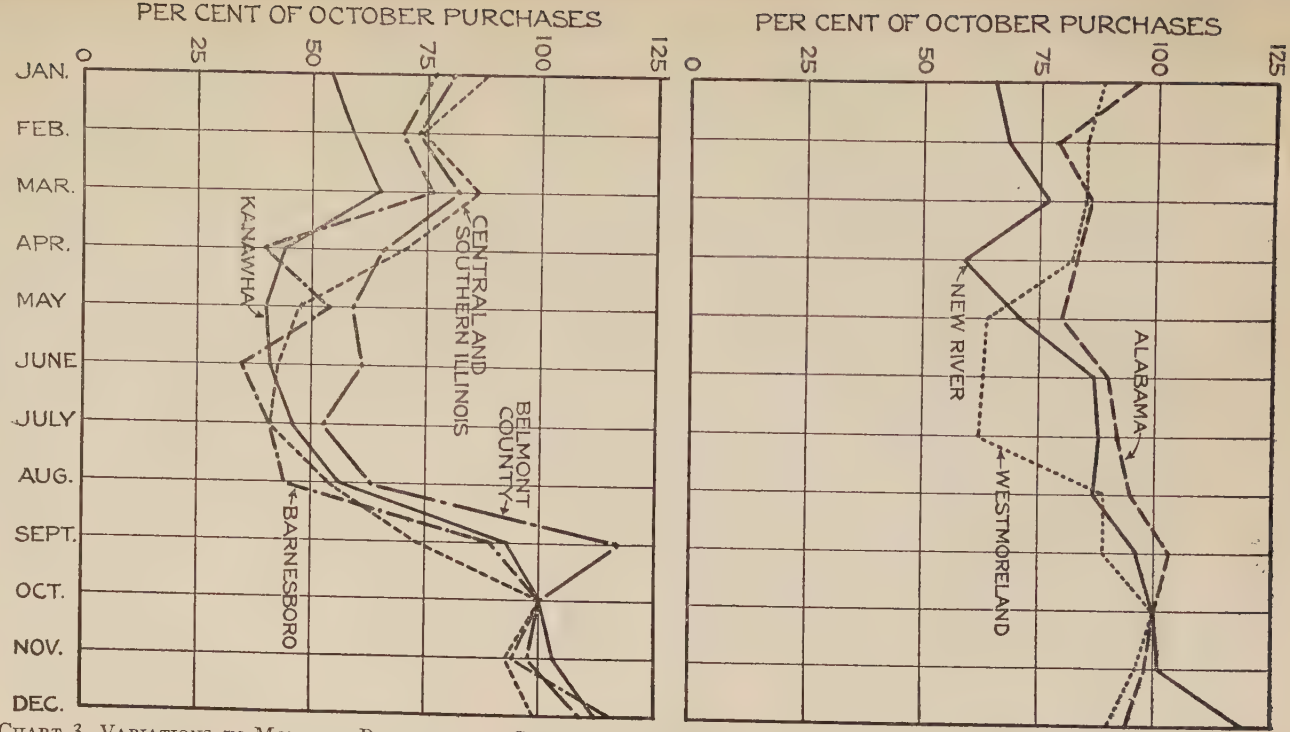

CHART 3. VARIATIONS IN MONTHLY PURCHASES OF GENERAL MERCHANDISE BY MINE WORKERS' FAMILIES IN SEVERAL DISTRICTS DURING 1922

(October purchases taken as 100.0)

mining population. Ten per cent of the families in patches, representing different conditions in each district, were visited to check over sources of supply and expenses listed on company books and to ascertain all further expenditures made, the amount of home produce, the size of the family, number of working members, and sources and amounts of income.

The amount of money spent for the year's food supply varied from $472.00 in Alabama mining camps, where the household numbered 4 members, to $636.00 in Ohio, where the household numbered 5 members. The actual difference per person per year is, therefore, only $9.00. The lowest per capita food purchasing took place in the Kanawha District, where relief had to be administered to needy families. The sum spent on food relief brought the total cost of food consumed in Kanawha to the level of expenditures in the Barnesboro and Westmoreland Districts of Pennsylvania, or to a little more than $100 per year per person.

In all mining districts the food purchased was food that appeased hunger at least cost. This was especially true in West Virginia and Alabama, where cereals or fats were eaten excessively and lean meats, milk, fruits and vegetables were consumed in quantities far below the demands of normal growth and health. Had miners' families purchased food conforming in amount and variety to the standard diets formulated by nutrition experts, increased expenditures would have had to be made. Food adequate to produce enough energy for the heavy labor performed by mine-workers and to keep families of the size of mine-workers' families in health, would cost, at prices current in December, 1922, amounts ranging from $161.00 and more in Ohio districts to $272.00 in the Kanawha District of West Virginia. (See Chart 4.)

Clothing ranked second in importance among the disbursements of the miner's family. Except in regions where strike conditions made clothing purchases abnormal, and in Alabama, the sum spent on clothing conformed to that spent by families in the group earning an income of $1500 to $1800 in industrial centers. In New River and in parts of Pennsylvania not affected excessively by the strike, $250 per year was the approximate sum spent. In Alabama, where families had but four members, the year's clothing disbursements totalled $167. Ohio mine-workers' families spent the largest sum on clothing, or $330 per year.

Only in Illinois did the year's rental approximate that of wage-earners' families in industrial centers. Usually the cost of the year's rent for mine-workers' families did not total $100. In company-controlled patches it is customary to make deductions before he is paid, as long as the miner is working, for rent, light, coal, doctor and other service. If the mine is closed temporarily deductions cannot be made and collections are not made. Usually, if

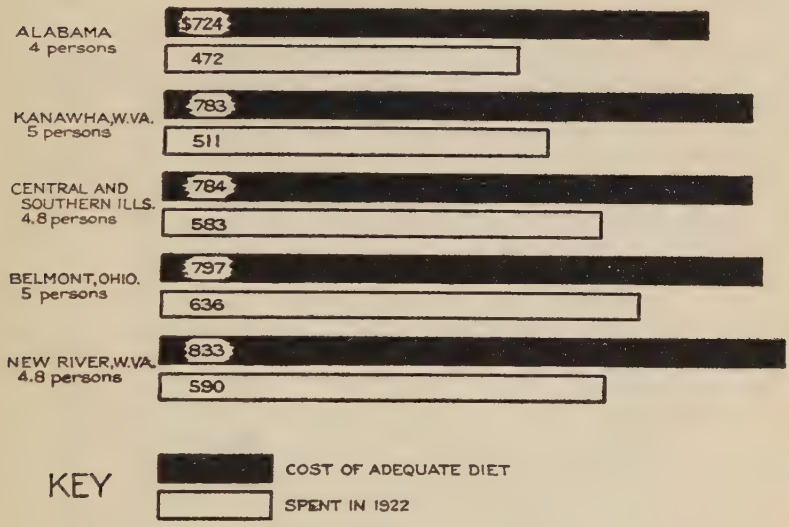

Chart 4. Amount Spent for Food by Mine Workers' Families in the Strike Year 1922, Compared with the Amount Necessary for Adequate Diet as Established by Nutrition Experts at the Prices in 1922 in Their Respective Districts

the miner remains in camp, housing and other fixed charges are allowed to accumulate and appear as "overdrafts" when next he secures a credit and debit account from the company. Sometimes companies deduct "overdraft" amounts from the first pay check, sometimes they distribute the charges over an extended period, and sometimes they never collect them. Consequently, the amount paid out for rent in many districts is less than the length of occupancy of the house and rental rates warrant.

The year's fuel bill is markedly less than in industrial centers It ranged from $25.50 in New River to $40 in Pennsylvania.

The following table is inserted to show the part which miscellaneous items played in expenditures. In this connection, it should be recalled that these data were collated from store and mine company records and that individual memory had no part in their formulation.

Reports from individual families indicated that the only other expenditures made that formed as much as 2 per cent of total disbursements were for insurance in Pennsylvania, Illinois and Ohio; house repair in Illinois; labor organization dues in Pennsylvania and Illinois; and for recreation, including automobile maintenance, in all districts. Payments on houses represented material savings among miners in Belmont County, Ohio, and the Central Illinois District. Savings bank deposits were small in all districts in 1922, the savings withdrawals far outnumbering the deposits.

The disbursements made by the bituminous coal mine-workers' families in 1922 would indicate that, except in the matter of clothing, their standard of living is below that of the skilled mechanic's family of the city. Irregularity of employment and consequently irregularity of income, together with the irresponsibility incident to life in the mining patch, are largely accountable for this difference. In districts of the southern Appalachian mining region, still so near to pioneer days, the miner can do little to improve his own condition. Land near the mines must be released for private purchase if the miner is to be encouraged in home ownership; sewage and sanitary arrangements must be made at the instigation of mine companies or other development companies. Public school courses in cooking and in food values alone will teach miners' wives what foods to purchase and how to prepare them. In districts like many in Ohio, however, where the miners live near farming districts or near industrial towns, the activities of the miner's family extend beyond the coal mine; its income consequently is more stable, and its standard of living conforms more nearly to that of other industrial workers.

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READY FOR RESCUE WORK

Principal expenditures made by bituminous mine-workers' families in 1922

ITEM	NEW RIVER, W. VA.		KANAWHA, W. VA.		ALABAMA		WESTMORELAND, PA.		BARNESBORO, PA.		SOUTHERN AND CENTRAL ILLINOIS		BELMONT COUNTY, OHIO	
	Number of families	Amount spent per year	Number of families	Amount spent per year	Number of families	Amount spent per year	Number of families	Amount spent per year	Number of families	Amount spent per year	Number of families	Amount spent per year	Number of families	Amount spent per year
Food	4,615	$551.84	4,366	$450.60	733	$439.18	494	$541.11	642	$502.17	540	$573.26	618	$508.69
Feed	4,615	37.83	4,366	37.38	733	33.25	494	1.43	642	9.16	540	10.14	618	27.78
Clothing and dry goods	4,615	246.75	4,366	172.12	733	167.84	494	243.05	642	227.03	540	198.95	618	333.09
House furniture and furnishings	4,615	56.89*	4,366	20.04	733	22.48	494	50.66	642	21.67	540	27.63	618	53.12
Tobacco products, candy and drinks	4,615	64.39	4,366	76.80	733	91.66	494	67.75	642	63.47	540	118.29	618	145.85
Drugs and toilet articles	4,615	47.61	4,366	20.04	733	16.78	494	61.12	642	33.51	540	30.85	618	41.37
Hardware and miners' supplies	4,615	60.01	4,366	49.12	733	97.14	494	84.31	642	105.51	540	67.36	618	170.08
Miscellaneous articles (including toys, books, kodaks, phonographic records, kerosene, auto accessories, etc.)	4,615	32.29	4,366	5.94	733	202.56†	494	3.59	642	22.53	540	71.44	618	59.09
Rent	4,318	88.40	4,238	57.00	733	82.80	426	94.71	552	91.68	134	152.76	413	105.09
Fuel	4,406	25.50	4,238	12.00	733	28.48	426	40.00	552	36.84	537	40.72	590	20.42
Electricity	3,383	15.82	2,009	10.72			102	24.00	209	25.62	164	22.41	46	17.48
Gas			572	29.88										
Water	145	12.23	70	6.00					24	14.50				
Doctor, hospital and prescribed medicine	4,406	28.67	4,238	21.88	733	24.00								
Burial fund	3,041	7.22	3,929	4.46										
School tax					733	6.00								

* A group of families entering district in 1922 had to pay first and later installments on furniture, thereby raising sum spent on furniture above upkeep level.

† Automobile gasoline and oil were important items included in miscellaneous item in Alabama.

3. ACCIDENTS AND HEALTH

The Commission found that there is no good evidence for belief that coal miners are subject to special occupational diseases in the United States. About one-third of the deaths among miners are due to accidents. If the accident rate can be reduced to normal, miners may expect to live as long as workers in other industries. As tested by insurance rates in Ohio and Pennsylvania, 10 per cent of all occupations listed take a higher rate than bituminous mining. Such occupations as steel erection, concrete working, railroad operation, junk dealing and window cleaning all are rated higher. Falls of roof and coal account for 50.02 per cent of the deaths;

TABLE 21

	PER 1000 EMPLOYEES	DAILY PRODUCTION PER EMPLOYEE
		tons
United States	4.08	3.81
Germany	3.11	1.26
Belgium	1.58	0.61
France	1.22	1.04
Great Britain	1.13	1.39

accidents from mine cars and locomotives, 18.16 per cent; gas and dust explosions, 12.21 per cent; electricity, 4.22 per cent; explosives, 3.75 per cent; other causes underground, 3.61 per cent; accidents at the surface, 6.06 per cent. In all, 4.30 men per 1000 employed were on the average killed through the 10 years preceding 1922. For the year 1922 the rates in the United States and abroad were as shown in table 21.

The higher accident rate per 1000 employes and lower rate per ton of coal obtaining in the United States is due to the favorable natural conditions here for mining coal, the larger use of machinery, the high speed at which the industry works and the venturesome spirit of the men in this and other American industries.

Mine inspection and compensation laws are powerful factors making for safety in the mines, but greater uniformity among the

State laws is badly needed. State inspection should be placed on a higher and generally better paid basis. Merit rating for insurance should be extended. Safety organizations should be kept up in each mining community in order to keep men thinking along safety lines. The research and demonstration work of the United States Bureau of Mines should be enlarged and extended and the miners' union, which has so far devoted its major attention to economic matters, will in safety matters find a wide field for usefulness.

It is reasonable to hope that the big disasters can be decreased in number and especially that by application of improved methods of protection the extent of such explosions as do occur can be severely limited.[1] It is also to be expected that accidents incident to underground haulage can be decreased. For the little daily accidents at the face, which in the aggregate result in as many deaths as those due to all other causes combined, only a spirit of constant watchfulness can be effective. Toward this the training in first aid and mine rescue work, which has now been given by the Bureau of Mines to nearly 100,000 miners, is a powerful influence. This should be supplemented by additional instruction, lectures, pictures, and all the other means of educating the men to greater care.

[1] This is a matter of particular importance, not merely because of the fact that explosions kill large numbers of men at one time and bring public condemnation down upon the industry, but also because the death rate is high and it is deaths, more than injuries, that add to the real cost of mining. Tabulation of the results of 4700 especially studied accidents of which 3100 were in coal mines, reducing deaths to time lost on the usual basis of 6000 days, brings out sharply the major importance of fatal accidents. The figures follow:

	Days lost
Death	486,000
Permanent total disability	66,000
Permanent partial disability	70,000
Temporary	58,170

Studies made by the Bureau of Mines demonstrate that by rock dusting the coal mines the explosion hazards can be largely eliminated. These experiments have been borne out by experience in British mines where use of rock dust has been required since 1920, and in which there have been no explosions since that date, where the rock dust was in fact used.

CHAPTER V

Miners' Wages, Hours and Earnings

To answer the questions other than those covered in Chapter IV, which are involved in the general inquiry as to whether the miners are getting a decent living, the Commission investigated the complexities of wage rates in the union and non-union fields, the actual volume of employment and collateral employment, the rate of labor turnover and absenteeism and, finally, the earnings of miners in 1,928 bituminous mines for 1921 and 285 mines for 1920.

1. WAGE RATES[1]

The current impression is that there is a standardized scale of wage rates in the union fields in the bituminous coal industry. The facts are that standardization is by no means complete in the union fields and, taking the industry as a whole, the variations in the rates of pay and the inequalities in the rate structure within and between coal fields, particularly as regards the piece-workers' rates, have given rise to gross injustices to large numbers of operators and miners. A thorough analysis of wage data is essential if these injustices and inequalities are to be removed and if intelligent action is to be the basis upon which new wage scales are to be formulated.

It was found advisable to present the wage data separately for union and non-union areas. In the various districts of the unionized fields rates in many occupations are fairly uniform, the same rate often being paid throughout a district and sometimes throughout a State. Furthermore, adjustment in rates occurred only at stated intervals, usually two or more years apart, and changes were made at practically the same time throughout all

[1] The examinations of wage rates in both the bituminous and anthracite industries were made under the direction of Dr. Charles P. Neill, who was in charge of the Commission's labor studies.

the union fields. In the non-union fields, on the other hand, because of a number of variable factors which will be discussed later, it was impossible to present the rate information graphically or by summary tables.

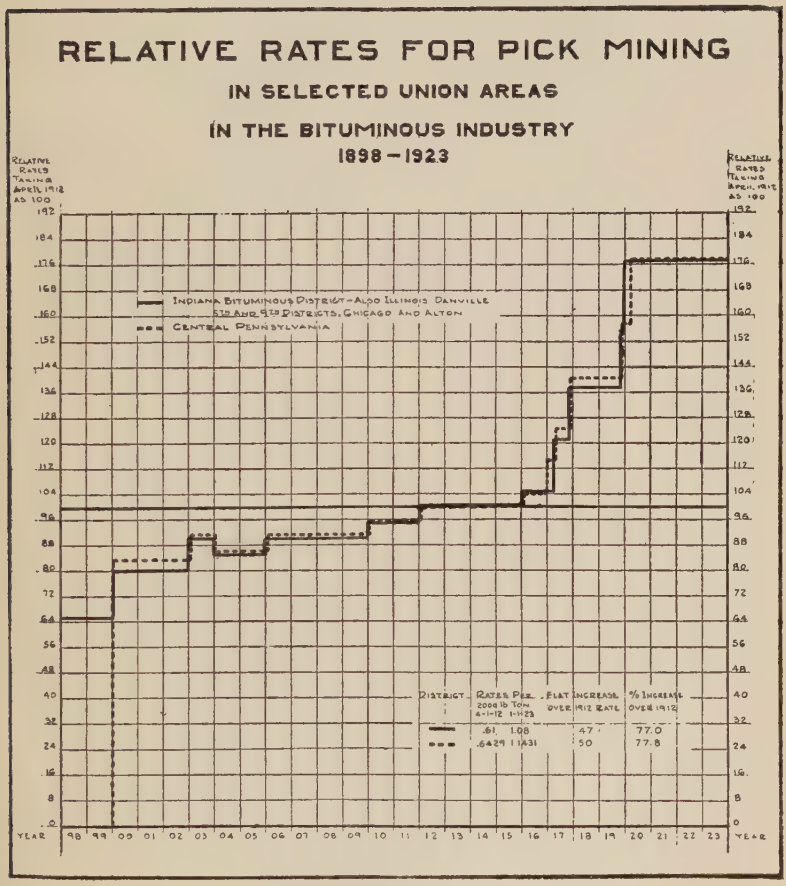
RELATIVE RATES FOR PICK MINING
IN SELECTED UNION AREAS
IN THE BITUMINOUS INDUSTRY
1898 – 1923
RELATIVE RATES TAKING APRIL 1912 AS 100
INDIANA BITUMINOUS DISTRICT – ALSO ILLINOIS DANVILLE 5TH AND 9TH DISTRICTS, CHICAGO AND ALTON
CENTRAL PENNSYLVANIA
DISTRICT
RATES PER 2000 lb TON 4-1-12 1-1-23
FLAT INCREASE OVER 1912 RATE
% INCREASE OVER 1912
.61 1.08 .47 77.0
.6429 1.1431 .50 77.8
YEAR
98 99 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23

CHART 5

In this summary it is necessary to confine the examination of wage rates to a number of the more important occupations in the larger coal fields. The charts show for selected union areas the

actual and relative rates for pick miners, inside brakemen and drivers and outside blacksmiths and carpenters. These charts graphically reproduce the trend of relative rates. The inserts on these charts give for each field the actual rates of pay as of April 1, 1912, and January 1, 1923, the flat increase in cents which has been granted over the rate in April, 1912, and the percentage represented by this flat increase. In constructing the charts the actual rates of April 1, 1912, were taken as 100 and the rates before and after, wherever available, were charted in relation to the rate of April, 1912.

The trend of pick mining rates in union areas. The Commission found that adjustments in rates occurred at about the same time in all the union fields, with the exception of the central Pennsylvania and the Michigan fields, which gave an additional increase, the former in January, 1917, and the latter in August, 1918.

Barring these two exceptions, in all the union fields for which data were available the rates of 1898 remained in effect until 1900, the new rates remaining unchanged for three years. The increase of 1903 was followed by a revision in all rates in 1904. The 1904 rates continued until 1906 and the rates established then remained effective until 1910. From 1910 until 1916 the agreements were made for periods of two years. The rates of 1916 were to have remained in force until 1918. However, the rapid and unprecedented increase in the cost of living brought on by our entrance into the war and the difficulty of maintaining an adequate working force of miners in the face of the higher wages which were being paid in other industries, made necessary readjustments of wage rates in both April, 1917, and November, 1917. Further increases were granted in December, 1919, and in the year 1920. Generally speaking, there has been no revision in rates in the union fields since 1920; the rates of January 1, 1920, are the present rates, and as a result of the agreement in 1924 they will remain effective until April, 1927.

The wage-rate data of the union fields show only one general decrease between 1898 and 1923; this occurred in 1904. The decrease continued in effect for two years. In 1906 the rates

prior to the decrease of 1904 were again established. Thereafter all changes in rates represented increases. It should be pointed out that both pick and machine miners in Ohio were given a slight reduction in 1914, occasioned by a change in the basis of payment from screened coal to run-of-mine, for which concession the miners accepted a decrease in the rate per ton. However, this decrease in the rates does not necessarily reflect a corresponding decrease in earnings. In some mines the lower rate applied to the run-of-mine basis produced higher earnings than the old rate applied on a screened-coal basis, but in some mines it probably resulted in small decreases in earning power.

Generally speaking, the rate level of the union fields is determined by the wage negotiations of the Central Competitive Field. The differentials established years ago have been maintained, changes in rates having taken the form of general flat increases in cents added to, and in the case of 1904 subtracted from, the tonnage rates.

The wage negotiations in the remaining organized areas are generally held after the joint conference of the Central Competitive Field and the rates agreed upon in the various separate joint conferences are to a large extent governed by the rates previously agreed upon in the Central Competitive Field. Thus, the operators of the Southwestern Interstate Field, consisting of Kansas, Missouri, Oklahoma and Arkansas, bargain as a group with the union representatives, and local negotiations are carried on separately for central Pennsylvania, Michigan, Iowa, western Kentucky and others.

The effect of the settlement in the Central Competitive Field on the other organized bargaining units, as well as the increases in rates in general, are shown in table 22.

The figures show that all but five of some twenty scale districts have given an increase of 47 cents per ton since April, 1912. Miners in the thin veins of Kansas and Missouri were given an increase of $1.217 and $0.717 per ton, respectively. These increases, so far out of line with the others, were given to enable the miners to overcome the handicap in earnings due to inability to produce more than a comparatively few tons per day

in the extremely thin veins. The lower increase falling to Hocking Valley and Pittsburgh No. 8 Districts was due, as previously explained, to the change in method of payment.

A more comprehensive study of rate data would show that in the Central Competitive Field, 18 out of the 21 scale districts

TABLE 22

Piece rates and total increases granted to pick miners in selected union areas of the bituminous industry, 1912–1923

SCALE DISTRICTS*	RATES PER 2000 POUND TON		TOTAL INCREASE OVER APRIL 1, 1912, RATE	
	April 1, 1912	January 1, 1923	Amount	Percentage
Ohio: Hocking Valley and Pittsburgh No. 8 Districts	$0.7143	$1.1164	$0.402	56.3
Indiana: Bituminous District, also Illinois: Danville, 5th and 9th, Chicago and Alton	.61	1.08	.47	77.0
Western Pennsylvania: Pittsburgh District:				
Thin veins	.6464	1.1164	.47	72.7
Thick veins	.5611	1.0311	.47	83.8
Southern Illinois: Williamson County, Cartersville, Duquoin, Odin, Jackson and Saline Counties	.57	1.04	.47	82.5
Central Illinois: Springfield	.617	1.087	.47	76.2
Kansas:				
Thin veins—Osage County	1.70	2.917	1.217	71.6
Thick veins	.78	1.25	.47	60.3
Missouri:				
Thick veins—Bevier, etc	.73	1.20	.47	64.4
Thin veins—Ray, Clay, Lafayette, etc	1.21	1.927	.717	59.2
Central Pennsylvania	.6429	1.1431	.50	77.8

* Districts in some cases combined.

examined gave flat increases which total 47 cents per ton. In the southwest Interstate Field the flat increases given from 1912 to 1923 total 47 cents in seven out of nine scale districts, while the flat increases granted for the same period vary only a few cents above or below 47 cents per ton in ten out of twelve scattered organized fields. The greater variations shown in the per-

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NATIONALITIES IN MINING

centage increases in rates are of course explained by the different basic rates paid in the several regions. It should be pointed out that the policy of adding a uniform increase in cents to tonnage rates may accentuate the inequalities in the earning capacity of miners. For example, in the Fifth and Ninth regions of Illinois, where pick miners can dig from eight to ten or more tons of coal per day and receive $1.08 per ton, a flat increase of 47 cents means a percentage increase of 77 per cent. In the case of the pick miner working in the thin seams of the First District, where only a few tons of coal can be mined in a single day, the 47 cent increase when computed on the higher tonnage rate of $1.74 per ton shows an increase of only 37 per cent.

Trend of machine mining rates in union areas. The relative rates of *pick miners* have been presented first, even though in the principal fields machine mining has to a very large extent displaced pick mining. Of the States in the Central Competitive Field, Indiana in 1921 had 52.8 per cent, Illinois 65.5 and the State of Ohio 91.6 per cent of the mining done by machine.[2]

The importance of machine mining is not reflected in the method of payment. The structure of rates for tonnage work continues to be based on the pick miners' rate over practically the entire union field. Certain differentials, varying in different districts, have been agreed upon for machine mining as compared to pick mining, and for a considerable period of years these differentials have been maintained at the same flat rate. When, therefore, the pick-mining rate has been agreed upon, the machine-mining rate is at the same time automatically fixed. The total rate fixed for machine mining is divided between the machine runners and the loaders. As a concrete illustration, in the Hocking Valley region the pick-mining rate is $1.1164 per ton; the differential of 17.5 cents allowed in favor of the pick miner makes the machine-mine rate 94.14 cents; this approximates 94 cents per ton for machine mining and is divided between the machine runners and the loaders by allowing the machine runner and his helper a total of 14 cents per ton and the loader 80 cents per ton.

[2] Mineral Resources of the United States, 1921—Part II, p. 511.

The low rate per ton to the machine runner is compensated for by the large tonnage with which the machine runners are credited. The machine is operated in a number of chambers, being removed from one to the other as fast as the undercutting of the coal in a chamber is completed. Thus the combined tonnage which a considerable number of loaders obtain would be credited to the runners of a single machine, and the earnings studies show that at the comparatively low rate per ton the machine runners make larger earnings than the loaders.

But while the machine mining rate is usually fixed by the collective contract, the division of this total machine rate in many instances is left for determination by the representatives at the individual mines or for small bargaining units. This is the case in both the Illinois and Central Pennsylvania coal fields, and because of the resulting variation in rates these union areas could not be included in table 23.

The wage scale of machine miners has undergone the same kind of changes which have been described for the pick-mining rates. There have been no general decreases in rates during the thirteen-year period for which rate data are available, except in the case of Ohio, where the change in the basis of payment was accompanied by a slight reduction. Furthermore, the adjustments in rates occurred at the same time as did those for pick miners.

The actual rates and the total increases granted to machine miners of selected union fields are summarized for the period beginning April 1, 1912, as shown in table 23.

The loaders in all cases received higher percentage increases than the cutters.

Rates of pay to day men. The practice of maintaining rate differentials, so important in setting tonnage rates, is not generally applied to the wage scale of day men. These wage-earners, constituting about forty per cent of the working force, are not on a piece-rate basis. For this reason the physical conditions under which the coal is produced do not directly affect their earning capacity and rates for the same occupation are more nearly comparable.

As early as 1898 a uniform work scale based on an eight-hour day was formulated for a limited number of inside day men in the Central Competitive Field. This scale was arrived at by first taking the average of the wages paid in all of the competitive districts and reducing this average to an eight-hour basis and then adding the increase previously granted.

Until 1904 the compensation of outside day men was arrived at by the individual employers and the employees in the various

TABLE 23

Piece rates and total increases granted to machine miners in selected union areas of the bituminous industry—1912–1923

AREA	CUTTERS				LOADERS			
	Rates per 2000 pound ton		Total increase over 4/1/12 rates		Rates per 2000 pound ton		Total increase over 4/1/12 rates	
	April 1, 1912	January 1, 1923	Amount	Percentage	April 1, 1912	January 1, 1923	Amount	Percentage
Ohio:								
Hocking Valley	$.075	$.14	$.065	86.7	$.418	$.80	$.382	91.4
Pittsburgh District, No. 8	.085	.1504	.0654	76.9	.427	.7896	.3626	84.9
Crooksville	.121	.1835	.0625	51.7	.414	.80	.386	93.2
Indiana: Bituminous District	.086	.148	.062	72.1	.399	.812	.413	103.5
Western Pennsylvania: Pittsburgh District:								
Thick vein	.0659	.149	.083	126.1	.3233	.734	.4107	127.0
Thin vein	.0805	.169	.0885	109.9	.3656	.771	.4054	110.9

districts. In that year the Hocking Valley district established uniform rates for some of the major outside occupations and for the unskilled workers. This practice has been followed by other fields, including those not in the Central Competitive group. Ever since 1898 the collective contracts of the central field have provided for adjustments in the rates of inside day men whenever revisions in tonnage rates were made. It was not until 1916 that increases in rates were specified for outside day labor.

Chart No. 6 has been prepared to show the trend in rates and the actual rates now being paid to the inside brakemen and drivers and to the outside blacksmiths and laborers in selected union fields.

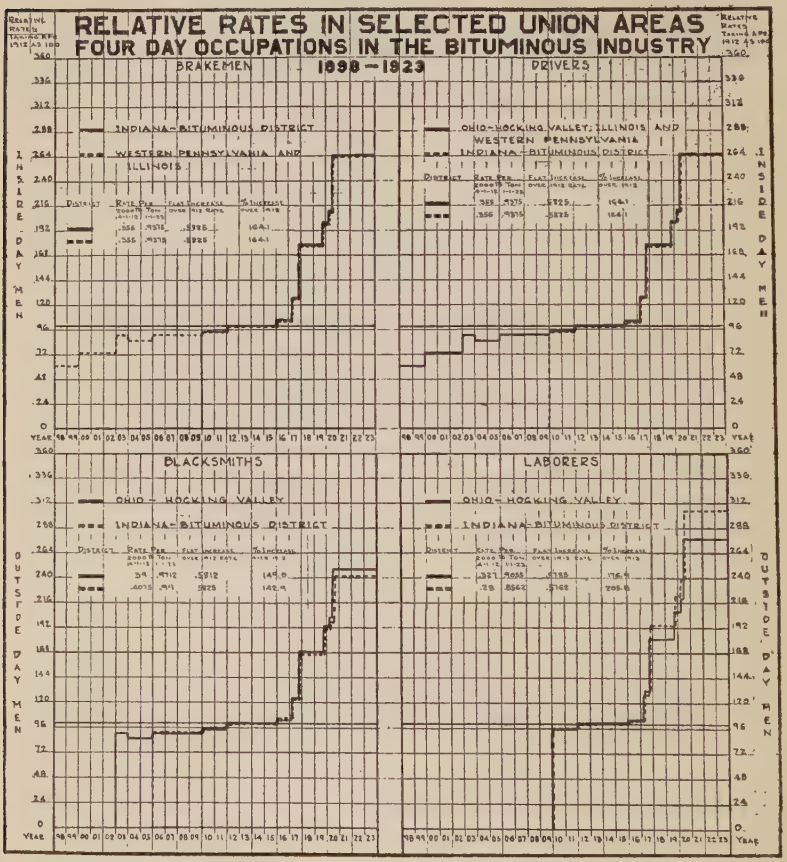


CHART 6

Inside day men. The Commission found a marked tendency towards uniformity, both in the trend and the actual rates of inside day men, but this uniformity is by no means complete. Variations in rates exist even in the more important skilled occupations.

In the case of brakemen and drivers, with the exception of the Pomeroy and Jackson districts of Ohio, the actual rates and the trend in rates are identical, not only for the Central Competitive Field, but also for the Southwestern Interstate Field and the State of Michigan. The rates and the trend in rates for motormen are the same for Hocking Valley, Ohio, Michigan and the Southwestern Interstate Field, with the exception of Kansas. The rate in Western Pennsylvania is slightly more than a cent higher, while the Indiana rate exceeds that of Ohio by almost eight cents. In Illinois there is no uniform scale for motormen. In the case of trackmen similar relative rates and hourly rates are found in Illinois, western Pennsylvania, Hocking Valley, Ohio, and the Southwestern Interstate Field. The rates received by inside laborers during the period 1912 to 1923 were the same in Hocking Valley, western Pennsylvania and Illinois. However, the rates were somewhat higher in Indiana and in the Southwestern Interstate Field, the same scale being in effect throughout these districts. There was some variation in the rates paid to trappers in the Central Competitive Field, although a single rate, practically the same as the Hocking Valley rate, was in effect in the Southwestern Interstate Field for the eleven-year period. In general the trend of rates in Michigan is somewhat higher, owing to a local adjustment in 1918.

Outside day men. While the outside day rates show a greater tendency towards variation, the rate data analyzed for the Commission show in the case of all occupations studied, that the same flat increase was added in most instances to the rate in effect in *April,* 1912. The flat increase paid to outside day men for the eleven-year period varied from 50 cents to 69 cents per hour; in the majority of cases, however, between 57 and 59 cents. It should be pointed out that within a given field, except in a few cases, there seemed to be an attempt to secure a uniform wage scale for the major occupations.

In the case of inside day men, with the exception of trappers, the flat increase added to the rate of *April,* 1912, varied from 57 cents to 68 cents per hour. However, as in the case of outside day occupations the total increase in most instances was from 57 to 59

cents. The trappers, consisting of boys and old miners, received lower total increases, averaging around 35 cents.

A comparison of the relative rates paid to inside and outside day men and those paid to pick miners shows during the eleven-year period that greater percentage increases have been given to day men than to men paid by the ton. Thus, the percentage increases paid to pick miners in the union fields, with the exception of West Virginia union areas, range from 37.0 to 83.8 per cent, the significant range being from 56 to 83. In contrast to these gains the inside and outside day men have secured percentage increases ranging from 139.0 to 257.1. In only a comparatively few districts did the total increases paid to day men over the *April,* 1912, rate amount to less than 164 per cent and in some instances, as for example in the case of the lower paid trappers, the percentage increases exceeded 223. The bulk of the percentage increases fell between 164 and 205. A similar comparison of the gains of day men and machine cutters and loaders would be greatly in favor of the day men.

A comparison of the trend of union rates, coal prices and cost of living. In order that a comparison may be made of the trend in rates of tonnage and day men with that of coal prices at the mines and the fluctuations in the cost of living, Chart No. 7 has been prepared.[3] The curves represent index numbers, the year 1913 being taken as the base. The pick-mining rates at Indiana bituminous mines, which correspond in every respect with the rates in the Danville district, the 5th and 9th districts and the Chicago and Alton counties of Illinois, have been used to indicate the movement of rates to pick miners. For machine loading the Indiana bituminous rates were considered as fairly representative. The relative rates computed for the brakemen and drivers, which are uniform for the Central Competitive Field, except the Pomeroy and Jackson districts of Ohio; for the Southwestern Field

[3] The price index was based upon the "average value per net ton of coal at bituminous mines in the United States." Mineral Resources of the United States, 1921—Part II, p. 534. The index numbers of the changes in the cost of living were published by the Bureau of Labor Statistics and represent the summarization of the retail prices collected for 32 cities—Monthly Labor Review—June, 1922, and February, 1924.

and for the State of Michigan have been taken to indicate the trend in rates of day men. The price of coal here used is the average value of all soft coal produced, f. o. b. mines.

An examination of Chart No. 7 will show that for fifteen years prior to 1913, the highest point reached by the index of price was 105.8, attained in 1903, when the great anthracite strike had created a shortage. Throughout the period up to 1909 the price was increasing faster than the wage rate, and the index of price in the diagram runs from 4 to 8 points above the wage index. In two years out of the period the price index is the higher by approximately fifteen points. By 1910, however, the wage index had caught up with the price index and from 1909 to 1913 their course is closely parallel. Between 1913 and 1916, both wage rates and the average price of coal lagged behind the increase in the cost of living. The average price of coal was about 1 per cent below the wage rates in 1914 and 4 per cent in 1915. In 1916 both rates and prices increased, the former approximately 5 to 7 per cent over the 1913 base and the latter 12 per cent. The increase in the cost of living over the year 1913 amounted to 10 per cent in June and 19 per cent in December, 1916.

Since 1917 the increases in the mine price of coal at all times have been much higher than either the increases in the rates of pick miners and loaders or the increases in the cost of living. The relative increases to the brakemen and drivers exceeded that of the average price of coal by 19 points and of the cost of living by 64 to 90 points in the year 1921. From 1913 until the latter part of 1920 (in the case of the Indiana loaders and until the fall of 1921 in the case of the pick miners) the increases in wage rates to tonnage men have been much less than the increase in the cost of living, and particularly in the price of coal. The rates of brakemen and drivers, because of substantial increases in November, 1917, and again in November, 1919, and April, 1920, maintained a closer relationship to the cost of living and at times exceeded it.

At the peak of high prices, in June, 1920, the cost of living had increased 116.5 per cent over the 1913 base and wage rates only 77 and 104 per cent for pick miners and machine loaders, respec-

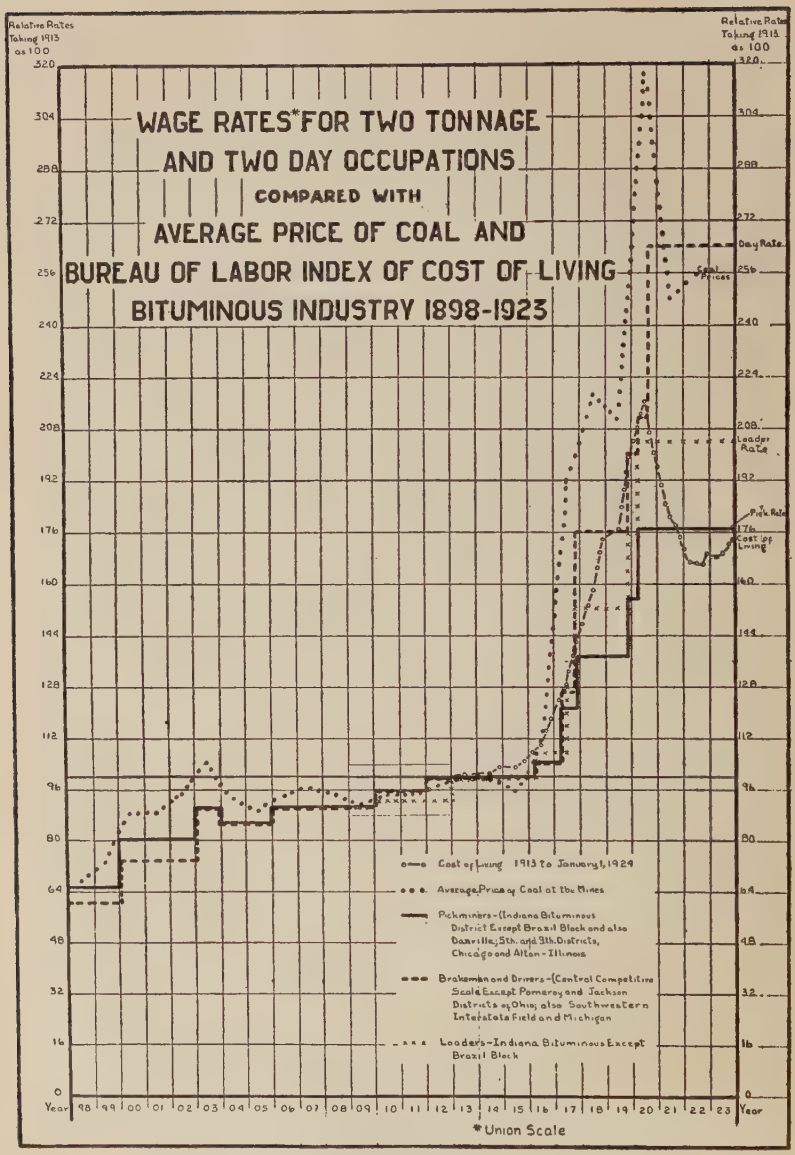
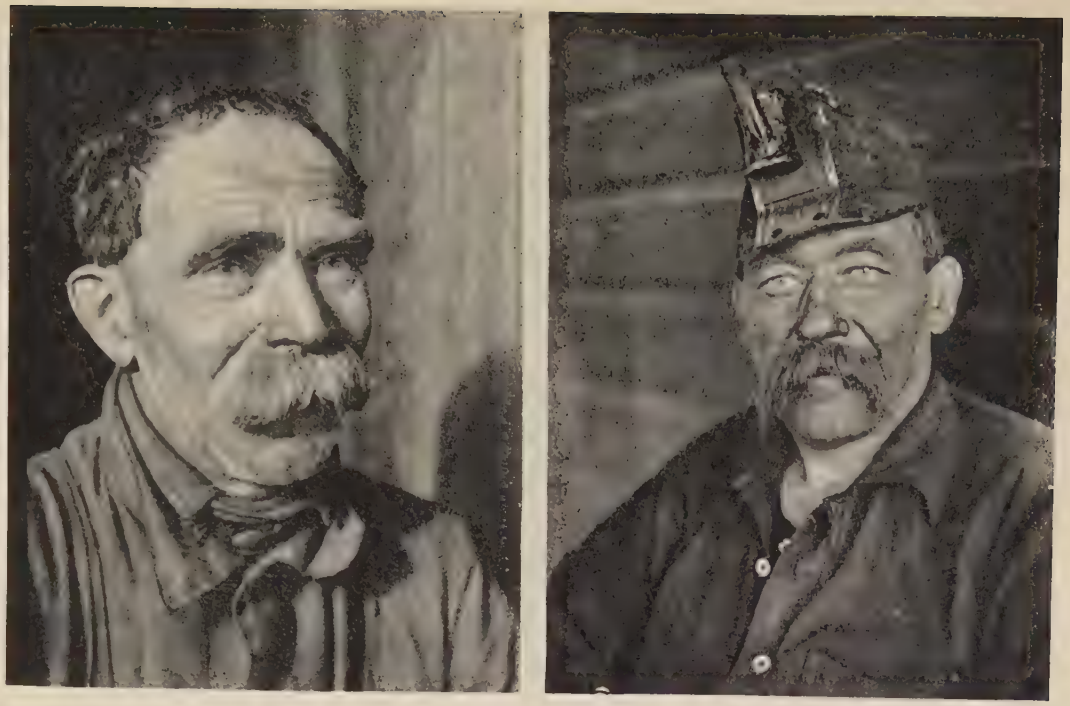

WAGE RATES* FOR TWO TONNAGE AND TWO DAY OCCUPATIONS
COMPARED WITH
AVERAGE PRICE OF COAL AND
BUREAU OF LABOR INDEX OF COST OF LIVING
BITUMINOUS INDUSTRY 1898-1923
Relative Rates Taking 1913 as 100
Day Rate
Coal Prices
Leader Rate
Pick Rate
Cost of Living
Cost of Living 1913 to January 1, 1924
Average Price of Coal at the Mines
Pickminers - (Indiana Bituminous District Except Brazil Block and also Danville, 5th. and 9th. Districts, Chicago and Alton - Illinois
Brakemen and Drivers - (Central Competitive Scale Except Pomeroy and Jackson Districts of Ohio; also Southwestern Interstate Field and Michigan
Loaders - Indiana Bituminous Except Brazil Block
Year
98 99 00 01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23
*Union Scale

CHART 7



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tively; the day occupations, however, falling only 5 points under the cost of living figure. The price of coal (using the average for all coal produced in 1920) had increased 218 per cent above the 1913 base, though the panicky market which produced this increase did not last. Then, in the midsummer of 1920, a further increase of $1.50 was made in the day scale, and the rates of brakemen and drivers were carried up to a level 164 per cent above 1913 and fully 50 points above the cost of living. Since 1920 union wage rates have remained stationary. The cost of living has gradually dropped to a point somewhat below that of the tonnage rates. On the other hand, the price of coal, although falling below the relative rates of the day occupations, has tended to keep its high level. At the close of 1922 the living costs were 73 per cent higher than in 1913; the wages of union pick miners, machine loaders and brakemen and drivers 77 per cent, 104 per cent and 164 per cent, respectively, and the average price of coal about 156 per cent.

In terms of the 1913 base, therefore, the rates of day men, as illustrated by brakemen and drivers, remain far above the rates of tonnage men and still farther above the index of the cost of living.

The comparison of wage rates and cost of living must not be understood to indicate a relationship between the income level of the workers and cost of living. It is possible that when living costs were decreasing miners had less opportunity for employment and consequently less total income. The relation between cost of living and income can be determined only by computing earnings on the basis of rates and time worked.

Wage rates in the non-union fields. In the case of the non-union areas it is not possible to present graphically or even by summary tables either existing rates or their trend. Rates of pay to tonnage and day men alike vary so from mine to mine and changes in rates are so numerous and so lacking in uniformity that the presentation of this information would require detailed tables giving rates for individual mines. For an examination of the variation of non-union rates and the careful comparison of these rates with those paid in the union fields, reference should be made

to the Commission's study of wage rates in this industry. There are, however, certain outstanding differences in the rate structure and the trend in rates between union and non-union areas. These may be pointed out.

Readjustments in rates. In the various *union fields,* excepting the union mines of West Virginia, there have been, with a few minor local exceptions, only six changes in rates for tonnage men and seven for day men from *January,* 1912, to January, 1923. In contrast with these, at 94 non-union mines tabulated for West Virginia, there were only five mines that reported less than seven changes in the rates of pick miners during this eleven-year period. Forty out of the 94 specified from seven to ten changes in rates; six reported eleven changes; eleven reported twelve and nine reported thirteen. In Alabama as many as fourteen and fifteen changes occurred during this same period and a number of instances of eleven changes and one case of thirteen changes were specified by the operators of non-union Kentucky. A still greater number of adjustments in rates occurred in non-union Pennsylvania. Here, in the case of 114 mines selected at random, 66 specified twelve changes in rates and four reported thirteen changes. One mine made fourteen, another fifteen and a third sixteen changes in rates.

A contrast of the periods between which changes in the union and non-union fields occurred will serve to indicate a further difference in the wage policy of these two groups of operators. In the *union fields* the 1912 rate continued in effect until 1916; there were three changes in rates during the war and one in 1920 for tonnage men and two for day men. The 1920 rates have been maintained without change and will continue in effect until April, 1927. But in the case of the 94 non-union mines tabulated for West Virginia, over half of the mines made two changes in the rates of pay to pick miners during 1920. In the year 1921 forty-four mines made a downward readjustment of the wage scale, which was followed in 1922 by another change on the part of six mines, two changes on the part of 58 mines, three changes on the part of 17 mines and three mines made four revisions in rates. Only ten of the 94 mines continued to pay the 1921 rate through-

out the year 1922. Of the 114 mines tabulated for non-union Pennsylvania all made at least one change in the rates of pick miners in 1920; in 1921 two changes occurred in the great majority of cases, which was followed by at least one further change in 1922.

The general conditions described above applied to the rates of pick miners. However, they may be considered representative of the rate readjustments made in case of both tonnage men and day men in the non-union areas.

Trend in rates at non-union mines. Similar contrasts between union and non-union fields are found in the trend of rates. Since *January,* 1912, in the *union fields,* with a few negligible local exceptions, the six revisions—seven in the case of day men—represent substantial increases in rates. The changes in rates in the *non-union* areas up to the beginning of the year 1921, also were in the nature of continuous increases. But while rates of the *union fields* have remained stationary from 1920 to the present, the changes in the non-union field in the year 1921 were, with few exceptions, decreases in rates and in many cases the revision in the first half of 1922 represented decreases. In the non-union mines of West Virginia, for example, wage-cutting began in the first half of 1921. A considerable number of mines lowered their rates in the second half of 1921. In some instances two decreases occurred in that period. There was also a very general reduction in rates in the first half of 1922. The same tendency towards general reductions in the year 1921 and the first half of 1922 is equally characteristic of Alabama, eastern Kentucky and to a less extent of Colorado. In non-union Pennsylvania the decreases were confined, in the main, to the year 1921.

The reductions in the rates at the non-union mines in West Virginia in 1921 and the first half of 1922 were in many cases made to offset the increases granted during the stress of 1919 and 1920. Consequently, these reductions brought the scale back to the level of 1917. In some instances, however, the decreases of 1921 and 1922 more than offset the increases granted in 1919 and 1920 and brought the scale below what it was at the close of 1917. In Alabama the more drastic reductions brought the scale down

to the 1916 base. In the latter part of 1922 the high price of coal and the demand for bituminous miners following the termination of the five-months' suspension in the union fields resulted in a general increase in the rates for all classes of workers in the non-union areas of Pennsylvania and the Southeast. In non-union Pennsylvania the amounts represented by the reductions were in practically all cases restored. In a considerable number of instances this was true of West Virginia, while in others the increase of 1922 did not quite make up for the previous decreases. In Alabama the revision in rates did not begin to offset the reductions made in 1921 and the first half of 1922.

Increases to non-union tonnage men. Barring one or two important exceptions, which were referred to in discussing the relative rates in the union fields, the flat increases granted the pick miners over the entire union field for the eleven-year period from *January,* 1912, to January, 1923, was in most cases 50 cents per ton, with a few variations ranging as low as 43 cents and as high as 55 and 58 cents. In contrast with this uniformity the total flat increase over the *January,* 1912, rate paid to pick miners on January 1, 1923, varied from 25 cents to 75.6 cents per ton in West Virginia. The bulk of the total increases in this region falls into two groups, between 30 and 40 cents, and again between 40 and 50 cents per ton. In non-union Pennsylvania 70 out of 114 mines paid increases over the 1912 rate, which totalled between 49 and 53 cents; 9 mines paid from 40-45 cents; six from 57-59 cents; two mines, 61 cents; 21 mines, from 65 to 69 cents, and one mine, 72 cents. The lowest increases for the period were 31 and 34 cents. In Alabama the total increase in the pick mining rates of January 1, 1923, over January 1, 1912, amounted to a maximum of 37 cents. A number of increases were as low as 25 cents, and in some cases the total increase was only 20 cents.

The total flat increases paid to machine cutters for the period beginning January 1, 1912, on up to January, 1923, are contrasted, irrespective of districts, for union and non-union mines in table 24.

In the case of machine loaders the total flat increase for the same period in the union areas, excepting the union mines in West

Virginia, varied from 40 to 52 cents per ton, the majority of the mines having paid between 42 and 44 cents. In the non-union areas, on the other hand, the range in total increases was from 21 to 58 cents per ton. In 166 mines, tabulated irrespective of fields, 33 gave less than 30 cents; 12 between 30 and 35 cents, inclusive; 46 between 36 and 40 cents; 37 between 41 and 43; 15 between 44 and 48, and 23 were scattered within the large interval from 49 to 58 cents.

Increases to day men in non-union fields. In the *union fields,* except the union mines of the Southeast, the bulk of the day men

TABLE 24

Total increases in cents per ton paid at union and non-union mines to machine cutters

(Increases represent the differences in rates between January, 1912, and January, 1923.)

AREA	NUMBER OF MINES PAYING A TOTAL INCREASE OF													TOTAL NUMBER OF MINES
	1 to 2 cents	2 to 3 cents	3 to 4 cents	4 to 5 cents	5 to 6 cents	6 to 7 cents	7 to 8 cents	8 to 9 cents	9 to 10 cents	10 to 11 cents	11 to 12 cents	12 to 13 cents	13 to 14 cents	
Non-union	1		10	4	7	4	21	33	3	5	1	2	1	92
Union				2	2	46	10	17	45					122

received total flat increases approximating sixty cents per hour over the eleven-year period beginning *January* 1, 1912, and ending January, 1923. In contrast to this uniformity the total increases granted brakemen ranged from 52 to 71 cents per hour for the same period at 101 non-union mines in West Virginia; 5 mines paying from 52 to 55 cents; 11 mines, 55 cents; 18 mines, from 57 to 59 cents; 35 from 60 to 62; 23 from 63 to 65; three mines 66 cents; four mines, 69 cents; one mine, 71 cents, and one mine adding only 30 cents to the 1912 rate. In non-union Colorado 15 out of 28 mines granted an increase of from 65 to 67 cents per hour; the remaining mines fell between 57 and 61 cents, except one which gave a 48 cent increase. In non-union Kentucky the total increases were somewhat lower than those in non-union

West Virginia, while in Alabama the maximum increase to brakemen amounted to 25 cents and the minimum to about seven cents per hour. In most instances the total increase for the eleven-year period fell between 20 and 24 cents.

As a general thing it may be said that the actual hourly rates of day men in the non-union fields are considerably lower than similar rates in the union fields. Brakemen in Alabama received between 37 and 47 cents per hour, those in Tennessee about 74 cents, in Virginia approximately 79 cents, while those in Utah received about $1.00. Table No. 25, showing the hourly rates paid to brakemen on January 1, 1923, at 306 non-union mines in West Virginia, has been presented in order to give an idea of the variation in the hourly rates paid to this class of workers. The rate to brakemen in the Central Competitive Field, except the Pomeroy and Jackson districts of Ohio, in the Southwestern Interstate Field and in the State of Michigan, is 93.8 cents per hour.

The significance of the different wage policies and rate levels in effect in the union as compared with the non-union areas receives new emphasis when viewed in the light of the economic competition within the industry. The advantages accruing to the non-union operators as the result of the comparative freedom from strikes and the flexible wage scales, permitting adjustment to meet market conditions, have been clearly demonstrated by the events of the last decade, particularly since 1920.

The bituminous industry for the last thirty-five years has been overdeveloped. This condition, together with such factors as the technical difficulties inherent in mining, varying geological conditions and an intricate system of freight rate differentials have tended to maintain a short annual working period and severe competition, not only between union operators in different fields, but more particularly between union and non-union fields. This has been especially true of the last decade or more.

The competitive forces working for the disruption of the industry were very acute just before the World War. At that time companies producing one-fourth of the tonnage of Illinois were estimated to be in bankruptcy. The mines in Ohio were, on the

TABLE 25

Showing by fields the number of inside brakemen receiving specified rates per hour in non-union mines of West Virginia, January 1, 1923

C. C. DISTRICT	COAL FIELDS	HOURLY RATES IN TWO-CENT INTERVALS																		NUMBER OF MEN	NUMBER OF MINES
		50	60.0 to 61.9	62.0 to 63.9	66.0 to 67.9	68.0 to 69.9	70.0 to 71.9	72.0 to 73.9	74.0 to 75.9	76.0 to 77.9	78.0 to 79.9	80.0 to 81.9	82.0 to 83.9	84.0 to 85.9	86.0 to 87.9	88.0 to 89.9	90.0 to 91.9	92.0 to 93.9	94.0 to 95.9		
10	Cumberland Piedmont																60			60	12
11	Fairmont																16			16	3
12	Pan Handle																4	35		39	7
15	Kenova													11						11	4
16	Thacker													23						23	4
17	Tug River							5	12		15	54		26		10				122	22
18	Pocahontas				10				272			9	9	81						381	61
19	Winding Gulf									5				10	150		46		13	224	20
20	New River													189						189	23
21	Kanawha								1				16	163	23					203	55
22	Coal River													1	21					22	8
23	Logan		9	12	22	128	17	2	30	7	5	120	7							359	71
24b	Coal and Coke																36			36	4
24c	Junior Phillipi	3															34			37	12
Total		3	9	12	32	128	17	7	315	12	20	183	32	504	194	10	196	35	13	1,722	306

whole, closed by a long and bitter strike. In 1914 the average working time was 195 days. Union operators in general were divided among themselves and their difficulties were enhanced by the competition from the non-union area of the Southeast, where in most of the fields mine-workers were being paid much lower wage rates.

After 1914 the heavy demand for munitions and other supplies created by the World War gave rise to an extraordinary market for coal. A further development of the coal reserves followed. The effect of the war period upon prices and the wage rates of the union mine-workers has been presented graphically in Chart No. 7. In the non-union fields the shortage of mine-workers, together with the fear of unionization, brought about substantial increases and for a time towards the close of the war, non-union rates in many of these fields were on a par with union rates.

The termination of the war again brought into play the destructive forces of competition. The union miners demanded and secured wage increases. Coal prices had begun to decline. The situation, however, was relieved by the extraordinary demand for coal in 1920, the result of a combination of factors such as the absence of consumers' stocks, owing to the strike in 1919, a severe winter and the tie-up of transportation facilities by the switchmen's strike. The coal miners, encouraged by the high prices and large profits, demanded still further increases. A series of strikes in the union fields added $1.50 to the day scale. A similar increase was granted by the non-union fields. Union and non-union operators alike were willing to make concessions in order to take advantage of the new high level of coal prices, which surpassed even the peak of the war period.

The general financial depression of 1921 "plunged the industry from the riotous prosperity of 1920 into the most acute prostration since the panic of 1893. Consumption fell off, and consumers, already heavily stocked, could not be induced to buy coal for storage. Prices dropped, mines began to close, and even for those remaining at work part-time operation was the rule. Wage cuts began in the non-union fields of Pennsylvania and Kentucky in April and June, gained momentum rapidly, and by the end of the

year extended to practically all non-union districts. The wage cuts carried non-union rates back to the level of 1919, and later, in some districts, back to that of 1917. Labor cost was reduced, and business began to be diverted from the union to the non-union fields. The pressure of the non-union competition rested very unequally upon the different union fields. Upon the fields of Indiana and Illinois, protected by a large differential in freight rates, it had comparatively little effect. The earnings of the miners in those States for 1921 were commonly higher than non-union earnings, but by the end of the year the pressure of non-union coal was bearing down with crushing effect upon the union fields that lay close to non-union fields and were shipping to the same markets."[4]

This situation continued until the latter half of 1922, when competitive conditions again changed. The coal strike of 1922 and the railroad shopmen's strike, which interfered with coal shipments from West Virginia and eastern Kentucky, created a shortage. The more favorable condition of the market broke the deadlock between union miners and operators and enabled the union operators to enter into competition with non-union producers. The 1920 scale of wages has been maintained in the union field, and the non-union operators, in order to hold their workmen and to offset the danger of unionization, have replaced in part, in some fields entirely, the reductions of 1921 and 1922.

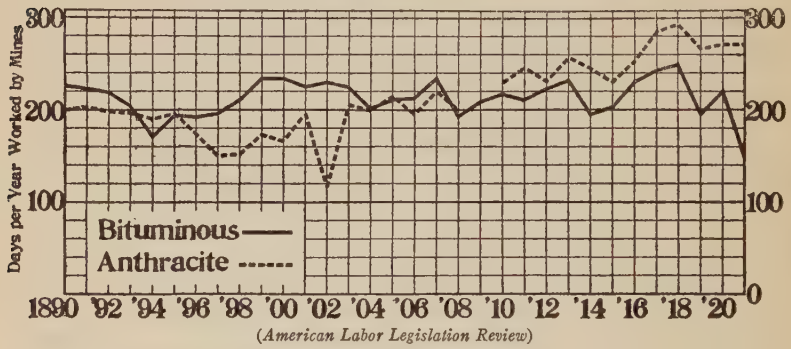
2. VOLUME OF EMPLOYMENT AND COLLATERAL EMPLOYMENT

The chief object of attention in most discussions of miners' pay is the hourly wage rate or daily earnings. Quite as important in determining the actual income of the miner is the question as to how many hours or days the miner works.

In one respect the employment of the miner is usually more secure than that of his brother who works at the building trades or that of his cousin who works in a factory. Miners are rarely discharged. If a man once obtains a job in a mine and comes up to the ordinary standards of proficiency, he usually remains on

[4] F. G. Tryon: American Academy of Political and Social Science, January, 1924. Vol. CXI, pp. 90 and 91.

the payroll of that mine as long as it works or until he quits of his own accord. If a mine is thrown open for work at all it commonly counts on operating with a full complement of men. Although there are many small mines that open when the price of coal is high and close when it falls again, the majority of commercial mines do not shut down for any long period, exceptions occurring, of course, in cases of disaster or during general industrial depression. Even in the extreme depression of 1921, about 49 per cent of the 1,928 mines studied operated in every payroll period, though it should be noted that this group did not include the smaller companies that ordinarily produce less than 50,000 tons.



(*American Labor Legislation Review*)

CHART 8. AVERAGE DAYS WORKED BY ALL BITUMINOUS AND ANTHRACITE COAL MINES, 1890–1921

But while a miner in most of the commercial mines is fairly sure of receiving some employment in every month of an ordinary year, this employment commonly falls very much short of full employment. A few mines operate regularly 6 days a week. But 5-day operation, 4-day operation, or even 3 or 2-day operation is, in the aggregate, far more common. A coal mine operates when it has orders for coal, and when railroad cars are on the siding ready to receive that coal; if either of these conditions is wanting, it does not operate. Taking the United States as a whole, there are far more coal mines open than it would be possible to keep steadily supplied with orders for coal. In certain sections there are more mines endeavoring to operate on a given railroad than that rail-

road could possibly keep supplied with cars; and as a general proposition, applicable to the whole country, whenever all the coal mines try to produce coal at one time, a car shortage is unavoidable. At times a strike is the main cause of mine shut downs; but ordinarily labor controversies—and likewise mine disability—are minor causes of lost time.

How important a factor in the whole labor and operating situation this intermittent operation of coal mines has been is evidenced by the figures for days worked by mines, collected since 1890 by the U. S. Geological Survey. A glance at Chart 8, which is based on these figures, shows both that the proportion of the year worked

TABLE 26

STATE	AVERAGE DAYS WORKED—1916-1921	EMPLOYEES IN 1921
Pennsylvania	234	190,643
West Virginia	208	101,850
Illinois	201	95,431
Ohio	186	51,785
Kentucky	196	50,521
Indiana	184	32,687
Alabama	244	25,809
Colorado	233	14,529

by bituminous coal mines is low, and that this low standard has persisted. As against a possible working year of 308 days, the number of days actually worked by bituminous mines has for many years averaged about 214 days. This was the exact average not only for the six war and post-war years, 1916-1921, but for the six pre-war years, 1910-1915 (the war having little effect before 1916). The average for the entire period of more than thirty years was 213 days. Expressed in another way, the bituminous coal mines of the United States, taken as a body, have been accustomed to operate slightly less than 70 per cent of a full-time year. In a period of more than thirty years there has been no perceptible improvement in this situation.

The annual employment offered is by no means uniform as respects the different mining areas or the individual mining opera-

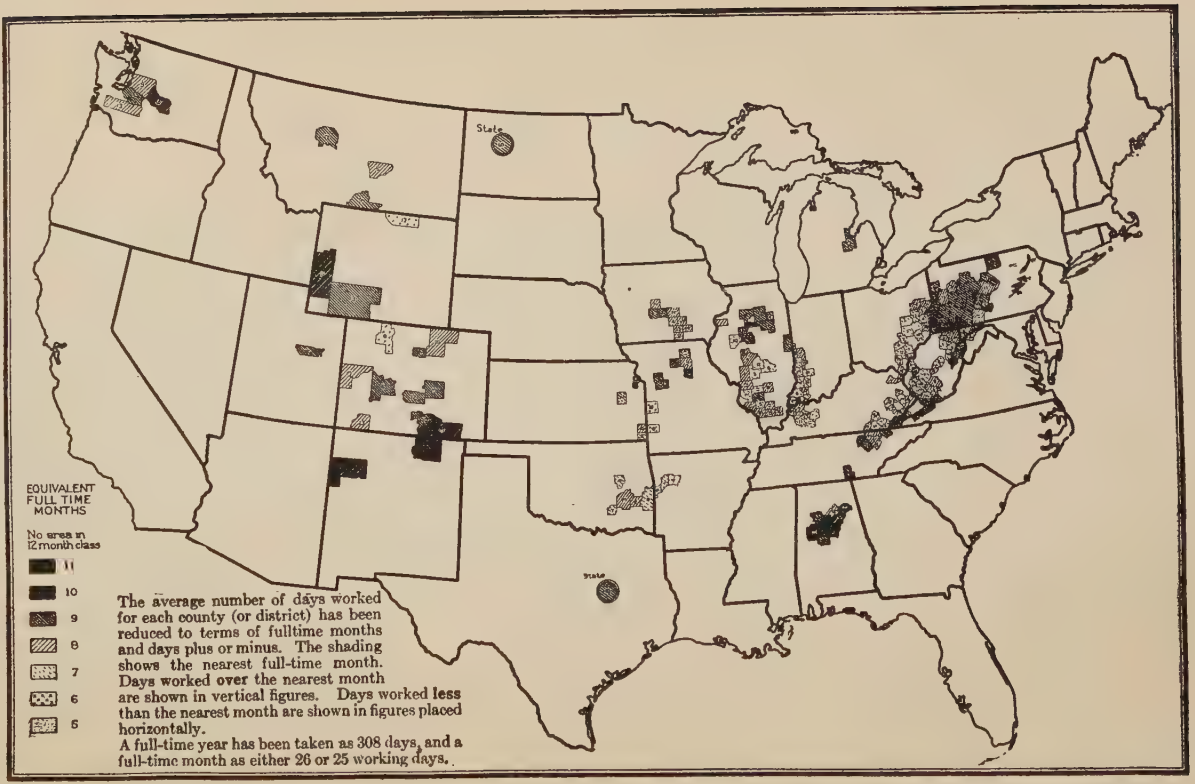

EQUIVALENT FULL TIME MONTHS
No area in 12 month class
11
10
9
8
7
6
5
The average number of days worked for each county (or district) has been reduced to terms of fulltime months and days plus or minus. The shading shows the nearest full-time month. Days worked over the nearest month are shown in vertical figures. Days worked less than the nearest month are shown in figures placed horizontally.
A full-time year has been taken as 308 days, and a full-time month as either 26 or 25 working days.

CHART 9. AVERAGE DAYS WORKED 1916–1921, BITUMINOUS COAL MINES BY COUNTIES, ANTHRACITE MINES BY DISTRICTS

(Based on Operators' Annual Reports to the United States Geological Survey)

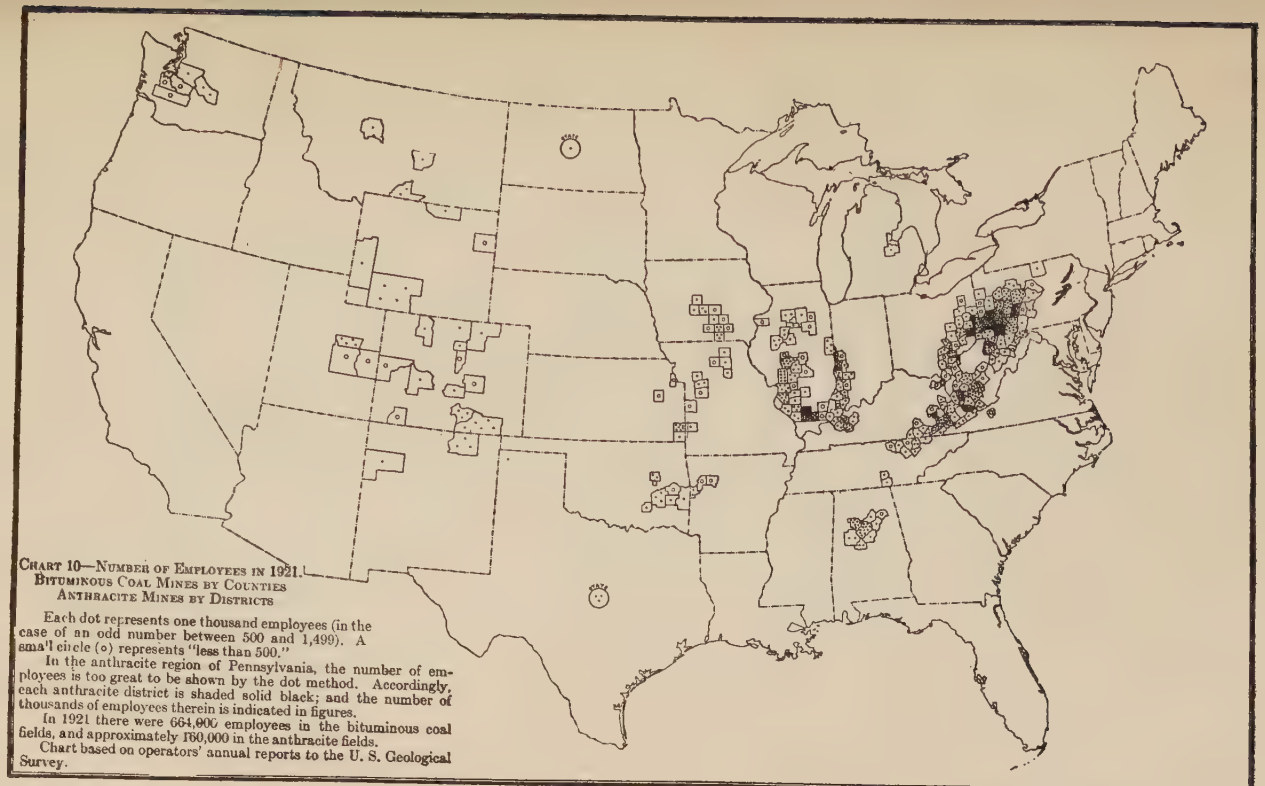


CHART 10—NUMBER OF EMPLOYEES IN 1921.
BITUMINOUS COAL MINES BY COUNTIES
ANTHRACITE MINES BY DISTRICTS

Each dot represents one thousand employees (in the case of an odd number between 500 and 1,499). A small circle (o) represents "less than 500."

In the anthracite region of Pennsylvania, the number of employees is too great to be shown by the dot method. Accordingly, each anthracite district is shaded solid black; and the number of thousands of employees therein is indicated in figures.

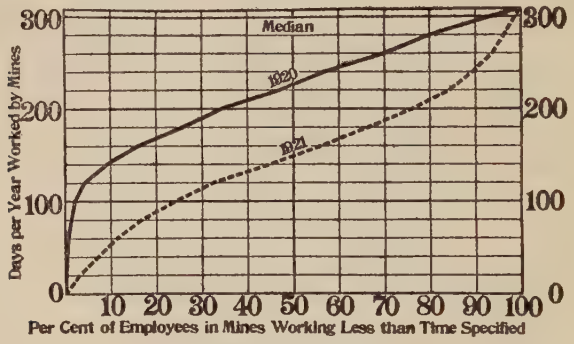
In 1921 there were 664,000 employees in the bituminous coal fields, and approximately 160,000 in the anthracite fields.

Chart based on operators' annual reports to the U. S. Geological Survey.

CHART 10. NUMBER OF EMPLOYEES IN 1921, BITUMINOUS COAL MINES BY COUNTIES, ANTHRACITE MINES BY DISTRICTS

tions within those areas. The eight leading bituminous coal States, as measured by the number of their employees in 1921, had average days worked, for the six years 1916-1921, as shown in table 26.

Chart 9 goes into greater detail and shows for each important coal county in the United States its relative standing as respects days worked. As some counties which stand out prominently on Chart 9 are relatively insignificant in the number of employees, Chart 10, which indicates the number in thousand employees in each county, has been added.



(*American Labor Legislation Review*)

CHART 11. CLASSIFICATION OF BITUMINOUS COAL MINERS BY DAYS WORKED BY THEIR MINES

The table and charts which have just been presented do not, however, tell the full story with regard to difference in mine time. For in most of the counties shown on Chart 9 a minute analysis would show that within the single county the mines vary radically among themselves in the matter of days worked. The evidence on this point cannot be presented in this brief summary. But Chart 11 shows for the bituminous coal fields as a whole the striking differentiation between mines in the days worked during given years. While some communities average higher than others, there is usually within a single county much the same sort of differentiation as is shown by Chart 11 for the country as a whole.

In considering the employment problem in the bituminous coal

industry, the striking diversity of conditions in different areas and among different mines, as illustrated by Charts 9 and 11, must be kept constantly in mind. For from this it follows that in many places conditions must be much worse than is indicated by the national averages, while in other cases conditions are not nearly so bad as might be supposed. This makes it impossible to mete out even-handed justice by any simple system of compensatory wage advances, at the same time that it makes the need for remedial action in the case of the badly affected mines doubly important.

In seeking to determine the effects of the employment situation in the coal industry on the miner it is essential to distinguish between the two major divisions of employees, the tonnage men and day men. The actual miners or tonnage men, who constitute about 60 per cent of the bituminous employees, are practically limited in their opportunity to work by mine operating time. These men are absent, on the average, about 10 per cent of this operating time; so that they are actually accustomed to work, on an average, nearer 193 days a year than 214. It will be seen from a reexamination of Chart 11, however, that many tonnage men must work much more than 193 days, and many men much less.

The day men, who maintain the mine and operate its transportation system—and constitute about 40 per cent of the employees—are frequently employed on days when the mine is not operating. A few of the day men work practically every day in the year, regardless of whether the mine is running; others work considerably more than the mine; but there are some who work no more than the mine. While an average here is apt to be misleading, because the men vary so much among themselves and because the figure is very different for a mine which runs 300 days (where few men work more than the mine) from what it is for a mine which runs 150 days, it nevertheless may be noted that in both 1920 and 1921 the day workers on the whole averaged some 20 per cent more working days (that is, eight-hour days) than did their mines.

It should be noted, however, that the figures of days worked by day men include any overtime work and any long days in excess of eight hours, all reduced to equivalent eight-hour days. They would be inflated somewhat by the occasional payment of

bonuses in the shape of credits for time not actually worked, and in 1920 this was a factor of some importance.

The loss in the earnings of labor, particularly of tonnage men, due to instability of employment, may readily be determined for any desired group by reference to Charts 9 and 11. No doubt the men themselves do not lose this entire amount, because wage rates must have been determined more or less with reference to the amount of employment available. But whatever the men themselves do not lose, owing to higher wage rates, that much of the loss due to idle time must be borne by their employers, or by the coal-consuming public. If 660,000 men are employed in mines which are idle 30 per cent of the time, this is equivalent to holding 200,000 men in idleness throughout the year. The day men perform some useful work while the mines are idle, but the greater efficiency possible under continuous operation probably makes it fair to say that the time of 200,000 men is actually wasted.

Of course, as long as the demand for coal is seasonal, a labor force large enough to meet the fall and winter demand will be somewhat in excess of that needed in the summer. But even when allowance is made for this factor, there remains an excess of labor that may be set down to sheer overdevelopment of the industry and that amounts to at least 150,000 men. (See Chapter VII, p. 271.) Assuming that the labor of a miner is worth from $1600 to $2000 per year, the monetary loss to the country arising from the wastage of the time of 200,000 men may be placed at a figure running up to $250,000,000 or $400,000,000 per year. Indirectly the losses are probably substantially greater than this, owing to the inefficiency, uncertainty, unrest and general confusion arising out of so irregular a system of operation and employment.

Comparing the bituminous coal industry with other industries, it is believed that, while "the permanency" of the demand for coal assures the coal miner of the continuance of the demand for his labor in some degree or other, yet in the matter of time lost within a given working week or month, the bituminous coal industry compares unfavorably both with other important American industries and with the coal industry in foreign countries and in the American anthracite fields. Indeed, it probably is not too much to say that at the present moment irregularity in operations and in

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NATIONALITIES IN MINING

employment constitutes the one most serious problem which the American coal industry has to face.

Voluntary absence on the part of the men also is a problem, but it is far less serious than the problem of lost mine time. The exhaustive statistical researches of the Coal Commission have shown that the prevalence of absenteeism among the miners has been considerably exaggerated. No complaint has been heard as respects the day workers. As respects the tonnage men, the absence rate has been found to be rather uniform, at about 10 per cent. In a mine operating about 4 full-time days a week, this would mean an average absence, due to sickness, disability and all other causes combined of only about 2 days a month. The per cent is higher than would be considered a good standard in a factory. But for piece-work employment, involving the physical strain, exposure to dampness and underground conditions met with in mining, a rate of 10 per cent cannot be considered as glaringly high. Almost the same rate prevails in mines which work 300 days as in mines which work 200; in union and in non-union mines; in the North as in many sections of the South (barring Alabama), in the East as in the West; in anthracite as well as in bituminous mines; in England as in the United States. However, some instances were found of absence rates which ran considerably higher than 10 per cent. Care was taken in the Commission's studies not to count men as absent who had really quit their jobs.

With the greater use of machinery and more systematic mine development which the future seems to hold in store for the coal industry, regularity of mine operation will tend to become more and more important. As machinery takes the place of hand work and mining operations are more regularly conducted, it will also become both possible and important that the absence rate among the men be reduced to substantially less than the ten per cent figure, which up to the present has been more or less excusable.

It has been found that the earnings of miners have, on the whole, been limited to what they receive in the mines. Their idle days usually come sporadically and for only a few days at a time. Most mining towns are more or less remote from other industries or from good agricultural lands. There are some places, especially

in the West, where mining and agriculture are followed in rotation. But it is believed that the problem of irregularity should be attacked mainly by endeavoring to make the work of the miner regular rather than by trying to entice him into collateral occupations.

3. LABOR TURNOVER

The relative amount of stability among mine employees is impressive. Even when mines close for a considerable period it is usual to open again with substantially the same working force. Normally, in industrial establishments, a period of inactivity would result in a wide scattering of the organization. The figures for turnover for 1921 do show extremes when analyzed mine by mine and district by district. However, when considered as a total for the 684 bituminous mines studied the ratio of separations to average number of employed is not an excessive figure.

The turnover for all tonnage men was 102; distributed among the tonnage occupations, the machine miners show a turnover of 76, loaders 110 and pick miners 97. The loaders have the highest turnover of the tonnage groups.

For outside day men the figure is 103, for inside day men 92. A salient fact in the turnover comparison is the relative stability of inside over outside day men. This is in striking contrast to anthracite, where the turnover ratio for inside men in 1921 was 88, with a turnover for outside of only 56.

For the Central Competitive Field in the bituminous industry there is no area in which the turnover ratio for 1921 amounted to 100 per cent for any occupation. Tables 27 to 32, inclusive, show the number of men and turnover for the major occupations.

As is usual in industrial establishments, the turnover is lower in union than in non-union mining localities. The figures for some of the important regions outside the Central Competitive Field are given below. Connellsville ranges highest in Pennsylvania, Logan and Kenova-Thacker in West Virginia, whereas central Pennsylvania, Westmoreland and Maryland have relatively low turnover figures.

In the anthracite industry, as shown in Chapter X, the tonnage

TABLE 27

Turnover by districts and occupations for areas in the Central Competitive Field—1921

OCCUPATION	ILLINOIS			INDIANA			NORTHERN OHIO			SOUTHERN OHIO			NORTHWESTERN PENNSYLVANIA		
	Average on roll	Exits	Turnover	Average on roll	Exits	Turnover	Average on roll	Exits	Turnover	Average on roll	Exits	Turnover	Average on roll	Exits	Turnover
			per cent			*per cent*			*per cent*			*per cent*			*per cent*
Machine miners	577	268	46.4	234	117	50.0	349	161	46.1	127	61	48.0	566	293	51.8
Pick miners	3,506	2,278	65.0	2,494	1,314	52.7	3	1	33.3				961	774	80.5
Loaders	4,634	2,814	60.7	2,240	1,223	54.6	2,952	2,151	72.9	1,071	965	90.1	4,481	3,906	87.2
Inside men	3,546	2,250	63.5	2,080	1,571	75.5	1,503	976	64.9	340	209	61.5	1,765	948	53.7
Outside men	1,175	456	38.8	534	532	99.6	441	283	64.2	173	85	49.1	839	508	60.5
Special group	28	11	39.3	20	11	55.0	4	19							
Total	13,466	8,077	60.0	7,602	4,768	62.7	5,252	3,591	68.4	1,711	1,320	77.1	8,612	6,429	74.7

TABLE 28

Turnover by districts and occupations for the bituminous industry—1921

OCCUPATIONS	PENNSYLVANIA											
	Central			Somerset			Westmoreland			Connellsville		
	Average on roll	Exits	Turnover	Average on roll	Exits	Turnover	Average on roll	Exits	Turnover	Average on roll	Exits	Turnover
			per cent			*per cent*			*per cent*			*per cent*
Machine miners	566	331	58.5	102	106	103.9	224	109	48.7	163	248	152.1
Pick miners	2,324	2,513	108.1	1,075	1,333	124.0	1,797	1,431	79.6	871	1,468	168.5
Loaders	5,030	4,325	86.0	847	1,290	152.3	1,896	1,990	105.0	977	1,963	200.9
Inside men	2,056	1,165	56.7	670	642	95.8	1,423	864	60.7	1,163	1,292	111.1
Outside men	1,455	1,074	73.8	392	379	96.7	1,096	852	77.7	765	1,050	137.3
Special group										158	196	124.1
Total	11,431	9,408	82.3	3,086	3,750	121.5	6,436	5,246	81.5	4,097	6,217	151.7

TABLE 29

Turnover by districts and occupations for the bituminous industry—1921

OCCUPATIONS	WEST VIRGINIA											
	Cumberland–Piedmont, Maryland			Panhandle–Fairmont			Kanawha–Coal River			Logan		
	Average on roll	Exits	Turnover	Average on roll	Exits	Turnover	Average on roll	Exits	Turnover	Average on roll	Exits	Turnover
			per cent			*per cent*			*per cent*			*per cent*
Machine miners	112	97	86.6	540	528	97.8	168	145	86.3	78	163	209.0
Pick miners	1,780	1,403	78.8	1,042	1,123	107.8	201	281	139.8	56	165	294.6
Loaders	113	125	110.6	2,531	2,924	115.5	1,336	2,534	189.7	548	1,169	213.3
Inside men	656	401	61.1	1,926	1,705	88.5	914	1,421	155.5	465	1,080	232.3
Outside men	313	277	88.5	841	820	97.5	406	550	135.5	139	376	270.5
Special group				24	15	62.5	11	25	227.3			
Total	2,974	2,303	77.4	6,904	7,115	103.1	3,036	4,956	163.2	1,286	2,953	229.6

TABLE 30

Turnover by districts and occupations for the bituminous industry—1921

OCCUPATIONS	WEST VIRGINIA									VIRGINIA		
	Kenova–Thacker			Winding Gulf–New River			Pocahontas–Tug River					
	Average on roll	Exits	Turnover	Average on roll	Exits	Turnover	Average on roll	Exits	Turnover	Average on roll	Exits	Turnover
			per cent			*per cent*			*per cent*			*per cent*
Machine miners	30	81	270.0	60	90	150.0	94	179	190.4	88	107	121.6
Pick miners	1	3		102	239	234.3	374	513	137.2	256	402	157.0
Loaders	200	439	219.5	686	917	133.7	888	2,071	233.2	837	1,661	198.4
Inside men	230	573	249.1	670	1,029	153.6	712	1,367	192.0	870	1,542	177.2
Outside men	138	305	221.0	296	409	138.2	366	640	174.9	434	1,211	279.0
Special group												
Total	599	1,401	233.9	1,814	2,684	148.0	2,434	4,770	196.0	2,485	4,923	198.1

TABLE 31

Turnover by districts and occupations for the bituminous industry—1921

OCCUPATIONS	KENTUCKY									TENNESSEE		
	Northeastern			Southern Appalachian			Western					
	Average on roll	Exits	Turnover	Average on roll	Exits	Turnover	Average on roll	Exits	Turnover	Average on roll	Exits	Turnover
			per cent			*per cent*			*per cent*			*per cent*
Machine miners	148	143	96.6	63	78	123.8	155	54	34.8	60	98	163.3
Pick miners	142	398	280.3	117	192	164.1	123	124	100.8	1,182	1,366	115.6
Loaders	1,925	4,347	225.8	468	1,073	229.3	1,205	630	52.3	338	595	176.0
Inside men	1,064	2,155	202.5	354	635	179.4	661	448	67.8	651	697	107.1
Outside men	612	1,220	199.3	106	218	205.7	229	127	55.5	307	357	116.3
Special group				1		0.0	8		0.0	18	17	94.4
Total	3,891	8,263	212.4	1,109	2,196	198.0	2,381	1,383	58.1	2,556	3,130	122.5

TABLE 32

Turnover by districts and occupations for the bituminous industry—1921

OCCUPATIONS	ALABAMA–GEORGIA			COLORADO			IOWA			MICHIGAN		
	Average on roll	Exits	Turnover	Average on roll	Exits	Turnover	Average on roll	Exits	Turnover	Average on roll	Exits	Turnover
			per cent			*per cent*			*per cent*			*per cent*
Machine miners	190	96	50.5	168	207	123.2	49	45	91.8	64	14	21.9
Pick miners	1,288	964	74.8	2,689	3,482	129.5	3,347	2,628	78.5	28	3	10.7
Loaders	1,447	1,095	75.7	1,053	1,722	163.5	305	231	75.7	457	130	28.4
Inside men	1,460	1,198	82.1	1,337	1,168	87.4	1,432	1,011	70.6	234	84	35.9
Outside men	612	595	97.2	862	1,052	122.0	481	364	75.7	91	34	37.4
Special group	54	103	190.7	69	115	166.7						
Total	5,051	4,051	80.2	6,178	7,746	125.4	5,614	4,279	76.2	874	265	30.3

occupations show more changes in personnel. The turnover for all tonnage occupations was 136. This is heavily weighted by the instability of contract miners' laborers—an occupation with a turnover ratio of 271 against 71 for contract miners and 77 for the few contract loaders.

The turnover is a significant figure, not only because it furnishes a measure of the attractiveness of mining as an occupation, but because it may be used as a corrective upon earnings figures. More markedly than in other industries it is true that the first weeks after the hiring of a new employee in a mine is a crucial period. If employees get beyond this initial stage of becoming acquainted with the concern, their continuance is fairly likely. However, the rapidity of labor turnover in the first month of employment inflates the number of men on the payrolls and affects the earnings data by the large number of men in short earnings groups. Consequently, the earnings recorded are not the annual earnings of the employee, but a figure dependent upon the length of the time he stayed at one mine. This complication could be eliminated if the short service employees made approximately the same daily earnings as men in more continuous employment. This is not the case in most tonnage occupations. And to include short service men in an average earnings figure not only lowers the potential average daily earnings in mining, but gives a lower average daily earnings than were actually made by men in the longer service groups.

4. EARNINGS

Method of collection. Data for the earnings study were collected in sufficiently detailed form to serve as a basis for a series of studies on other phases of labor relations. No past experience aided in drafting a form for collection. In some of its studies the Commission could continue or modify forms standardized by the Federal Trade Commission or other war or post-war agencies. No such precedent existed for the labor group. New methods of collection had to be originated, with consequent misunderstanding of instructions and irregularities in entries.

The enormity of the task cannot be appreciated from the mere statement that the final study included earnings for more than 50

per cent of the workers in bituminous mining and 80 per cent of those employed in anthracite.

The piece work basis of payment for about 60 per cent of the bituminous and 40 per cent of the anthracite employees made invalid a computation of yearly earnings from an intensive study of earning power in a few pay periods. Seasonal output made the record of a full year desirable. The strike of 1922, with the shift of production to the non-union areas, would have ruled out that year even if the investigation had not been undertaken before its close. It was finally decided to study the year 1921 intensively and add as much supplementary data for the year 1920 as possible.

The earnings data, collected on a form known as L-1, were transcriptions of the payrolls showing by semi-monthly pay periods earnings and time worked. The filling in of these forms was done by the clerical forces of the coal companies. Assembly by field agents of the Commission would have been prohibitive in time and cost.

Yet, from a statistical point of view, the collection of the data by pay periods was essential. Many a mine-worker finished the year in a different occupation from that in which he started and it was necessary to know the time of transfer in order to classify him in the occupation in which he made his major earnings. Not only the rate of pay, but charges for blacksmithing, powder and all occupational items for which the miner pays, might be affected by such a transfer. Since the earnings record of each man was continued on the same line of the form throughout the year, absence, idle time, or termination of employment were easily noted. The record by pay periods was an aid to accurate reporting, since gross amounts could be entered exactly as they appeared and all totalling could be, and was, checked in the offices of the Commission. Only a limited amount of field checking was possible and an exact comparison of payroll items was more feasible than the totalling of amounts. Perhaps the greatest consideration was the difficulty of securing time for piece workers. No record is kept of the time spent in the mine by miners in tonnage occupations. At most mines the only indication of the attendance of a tonnage worker is furnished by the tipple record, crediting the dumping of one or more cars of coal to the employee's check number. Its use

by the Commission as an indication of time worked by tonnage men meant that the operator was obliged to add to the work of transcribing his payroll for a full year that of entering, from a bulky sheet, the number of days on which a miner had coal hoisted.[5]

Method of tabulation. Three problems were kept in mind in totalling earnings data: the separation of earnings for each of 40 occupations in anthracite and 20 in bituminous, the time worked to secure the earnings, and the distribution of the time throughout the 24 pay periods.

Earnings were tabulated in frequency intervals of $100 and the corresponding time in intervals of 10 days. Owing to the large number of districts in the bituminous industry the preliminary summaries totalled 726 tables. These were averaged for each occupation in every earnings interval and the final district tables crowded into the compass of three or four to a district. Even then, the folios of tables contained 172 bituminous and 137 anthracite tables.

A report in such form is not useful to the hurried reader. There was time for little interpretation of the material. In addition, the data had distinct limitations in that the tables as presented did not show annual earnings but the amount earned while an employee remained at one mine; the shifting of employees meant duplication of names on the rolls of the various mines. For the coal industry even the average number employed is a particularly difficult figure to compute.[6] The following summary obscures

[5] This measure is called a start, and may or may not be the equivalent of a full-time working day. The figure is subject to some error. On the one hand, one or more cars of coal may be dumped in the morning from a previous day and the employee credited despite the fact that he was not in attendance; on the other hand, a whole day could be spent clearing falls of rock and doing other work preparatory to mining, when no coal was hoisted and no credit for attendance given. Throughout this report the time of tonnage men is referred to in "starts" and must not be regarded as equivalent to full-time working days.

[6] The tipple records indicate only roughly the number of days tonnage men start to work, and nothing of the length of time per start. In the case of day men a record of the number of days and hours is kept, and it would seem possible to compute the number of man-days worked and divide by the number of mine days. The error of such a figure varies

some of the most important findings of the Coal Commission's report. However, it should serve to show the wide variation in the earnings of coal miners and the impossibility of regarding the various districts as units from the point of view of earnings.

Earnings by districts. The study of earnings of bituminous coal miners summarizes the records of 1,928 mines for 1921, and 285 mines for 1920. Table 33 shows the number of mines tabulated in each of the coal States.

Within the States differentiation of the important trade fields and varying union or non-union affiliation of the mines added additional sub-divisions to the report. In this summary some of these important distinctions necessary for detailed comparison, and many of the smaller districts, are omitted. Comparisons are shown for

(1) The Central Competitive Field.
(2) West Virginia.
(3) Pennsylvania.
(4) The major southeast non-union States.
(5) And four of the largest producing States west of the Mississippi.

These important areas are selected for comparison in order to avoid the necessity of combining localities differing widely in geographical and industrial features.

The Central Competitive Field includes Illinois, Indiana, Ohio and the Pittsburgh area of Pennsylvania. The 483 mines tabulated for this area, in 1921, employed during the pay periods that

directly with the regularity of mine operation. A mine is considered in operation when the tipple is hoisting coal. For workers paid by the day there is much opportunity for employment when the mine is idle. The use of such a method would greatly inflate the figure for average number employed wherever operation was irregular.

It was first necessary to use a figure that would not be dependent upon days worked. If a mine operated 24 pay periods, the average of the semi-monthly payrolls would give a fairly reliable figure. It was, therefore, decided to adapt this method of securing the average number employed per pay period to the mines operating irregularly. A figure for each mine was secured by ascertaining the total number of man-pay periods during the year and dividing by the number of pay periods the mine worked. This figure includes short absences within the pay period, but

the mines were in operation, an average of 74,619 tonnage men and 37,067 day men. Of the tonnage men, 39 per cent were in Illinois, 12 per cent in Indiana, 17 per cent in Ohio and 32 per cent in the Pittsburgh area of Pennsylvania.

TABLE 33

Number of mines tabulated for each bituminous coal-mining state

STATE	NUMBER OF MINES					
	1921			1920		
	Union	Non-union	Total	Union	Non-union	Total
Alabama		53	53		3	3
Arkansas	9		9			
Colorado	9	49	58		27	27
Illinois	142		142	3		3
Indiana	67		67	9		9
Iowa	47		47	3		3
Kansas	27		27	4		4
Kentucky	29	84	113	1	26	27
Maryland		26	26		13	13
Michigan	8		8	4		4
Missouri	13		13	2		2
Montana	10		10	5		5
New Mexico		24	24		3	3
North Dakota	1		1	1		1
Ohio	127		127	6	4	10
Oklahoma	25		25	1		1
Pennsylvania	362	271	633	31	40	71
Tennessee	17	17	34		2	2
Texas	3		3			
Utah		12	12		1	1
Virginia		33	33		1	1
Washington	17		17	6		6
West Virginia	225	182	407	67	20	87
Wyoming	39		39	2		2
Total	1,177	751	1,928	145	140	285

does not weight for absence of one or more pay periods. The figure is considerably less than the "number reported on L-I," which includes all names appearing at any time during the year, and inflates the figures for a district by the number of men who appear on two or more mine rolls during the year.

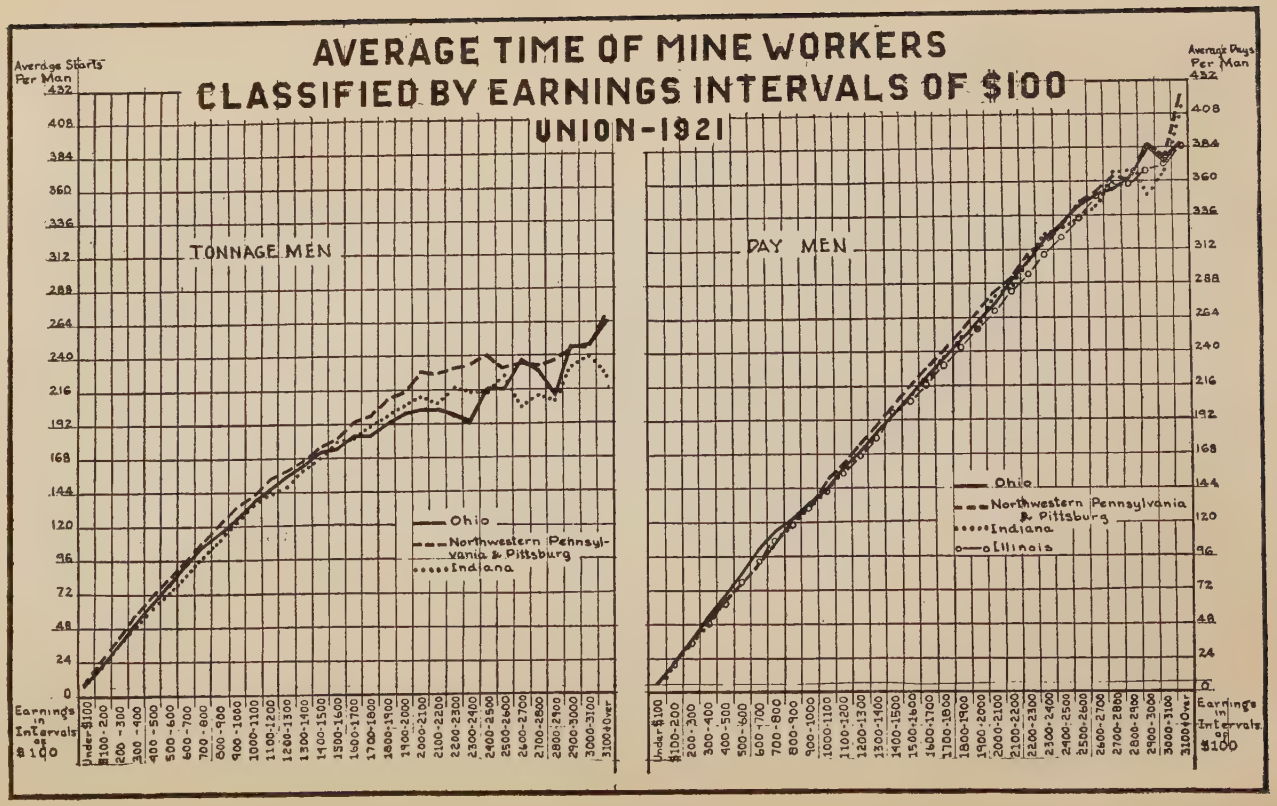
AVERAGE TIME OF MINE WORKERS
CLASSIFIED BY EARNINGS INTERVALS OF $100
UNION-1921
TONNAGE MEN
DAY MEN
Average Starts Per Man
Average Pays Per Man
Ohio
Northwestern Pennsylvania & Pittsburg
Indiana
Illinois
Earnings in Intervals of $100

CHART 12

The left-hand segment of Chart 12 shows the average starts per tonnage man in each earnings class. The chart does not show annual earnings, but is used to compare earning power in different districts by showing on the vertical scale the average number of starts required to earn certain specified sums. The earnings on the horizontal scale are shown in frequency intervals varying by $100.[7] The lowest curve, the one nearest to the horizontal scale, indicates highest earning power, since on the average less working time is required to secure a given amount of earnings. The dotted curve for Indiana shows that tonnage men in this State

TABLE 34

Average earnings per start for tonnage men—in 1921

AREA	PICK MINERS	LOADERS	ALL TONNAGE MEN*
Indiana	$7.73	$8.58	$8.35
Ohio	Few pick miners	7.52	7.86
Northwestern Pennsylvania and Pittsburgh	7.55	6.79	7.26

* Includes machine miners as well as pick miners and loaders.

averaged fewer starts to make the same earnings than tonnage men in the Pittsburgh area. The average starts worked are also lower than in Ohio, with the exception of earnings intervals be-

[7] The earnings scale on the charts has been stopped at the $3100.00 earnings interval. In the whole bituminous industry in 1921 there were 263 tonnage men in non-union and 329 in the union fields with earnings of $3100.00 and over; 39 men in the non-union areas earned $4000.00 or over, 36 men were found in the same group in the union areas. It is true that the average starts per man in the higher earnings intervals is less than the possible number of days in a full-time working year, yet the number of men involved is not considerable in the light of the continuous reference to the high earnings of miners. The bituminous industry showed no such extremes as the anthracite afforded. Even when one takes the year 1920 and considers only full-year employees, men who remained on the roll of one company for 24 pay periods, he finds only 7 per cent of tonnage employees in the non-union and 4 per cent in the union fields earned $3100.00 or over. The proportion would be less if one had an unselected group of mines.

tween $1,700 and $2,500. Computing the earnings per start of all men reported from each district, Indiana tonnage men average $8.35 per start, Ohio $7.86 and western Pennsylvania $7.26.

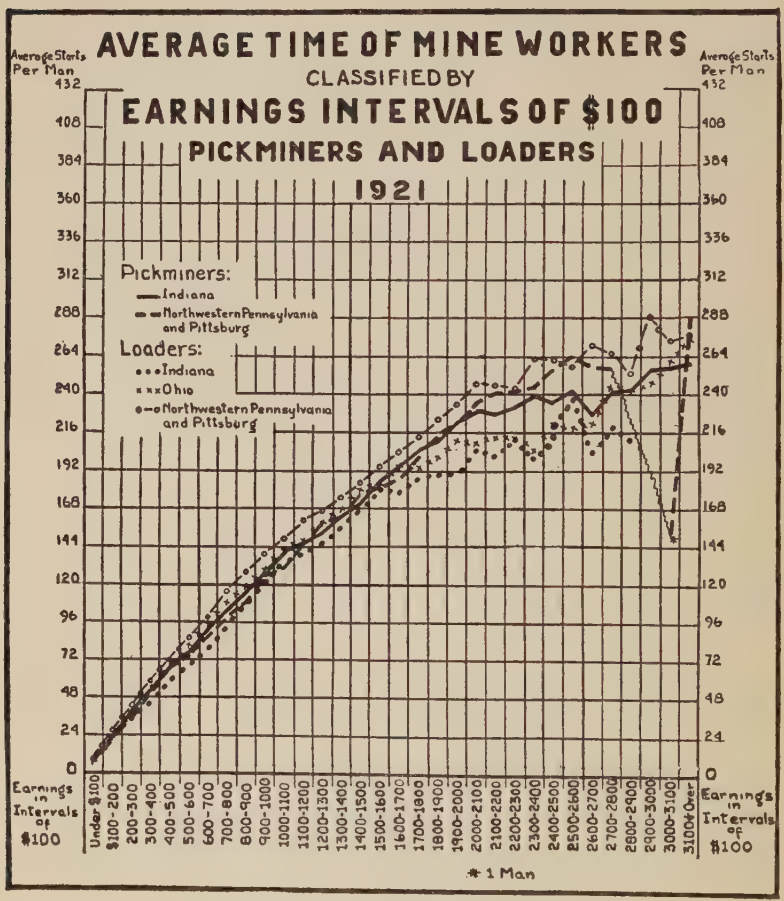

Chart 13

This comparison for all tonnage men disregards any difference in the average length of operation per start, as well as differences in the methods of operation—for instance, the Ohio fields

have relatively little hand-mining and consequently employ few pick miners. Indiana has its numbers employed about evenly divided between hand and machine workers, while about 7 per cent of the tonnage men in the Pittsburgh area are pick miners. Chart 13 shows the average starts for pick miners and loaders in these areas. The curve of the Indiana loaders is lowest and represents the shortest working time for a given earnings interval; the longest time is for loaders in the Pittsburgh area.

The only indicator of differences in length of operating per start is furnished by the average number of hours the tipple hoists coal. This represents mine time. There is no record of the time tonnage men work per start. The average length of tipple starts does not vary sufficiently between the areas to account for the differences in earnings curves. In 1921 the average hours per start reported for tipple operation was 7.8 in Indiana, 7.4 in Ohio and 7.6 hours in the Pittsburgh area.

One is then warranted in concluding that for the Central Competitive Field, excepting Illinois (for which comparable data were not available), tonnage men made highest earnings per start in Indiana and lowest in the Pittsburgh area. This conclusion holds for the major tonnage occupations as well as for the combined groups.

The segment on the right of Chart 12 shows the earnings of day men. The average days per man in the same earnings class vary little in the areas of the Central Competitive Field. The average earnings per day were highest in Illinois.

The figures of number of days worked by time workers or day men used in this study are the total number of hours worked reduced to equivalent eight-hour days. Where day men work overtime or where the established day is nine, ten or twelve hours, this method of computation may give a result in excess of 308 days, the normal full-time year of the mines, or even in excess of 365 days when men work Sundays. These facts explain the appearance in the charts of men shown as working 400 days or more in the year.

Annual earnings. Annual earnings as opposed to daily earnings show the effect of irregularity of operation of the mines. Conse-

quently, average annual earnings of miners is a particularly difficult figure to state. Some mines in an area may work a small number of starts, whereas others work the major part of a working year. Tabulation was made for men who began and ended the

TABLE 35

Average earnings per 8-hour day for day men—in 1921

AREA	INSIDE*	OUTSIDE	TOTAL
Illinois	$7.54	$7.28	$7.46
Indiana	7.51	7.07	7.38
Ohio	7.22†	7.13	7.20
Northwestern Pennsylvania and Pittsburgh	7.39	6.75	7.15

* Trapper boys are included in the figure for inside day men in all districts. The original tables show the occupations separately but the amount of work involved made separation impossible in this summary.

† Some districts in Ohio have a higher average for day men but the low rates paid in the Jackson and Pomeroy districts reduce the average for the State.

TABLE 36

Earnings of full year tonnage men and day men in the Central Competitive Field

	TONNAGE MEN			DAY MEN		
	Median	Quartile		Median	Quartile	
		Lower	Upper		Lower	Upper
Illinois*	$1,500	$1,210	$1,825	$1,610	$1,335	$2,040
Indiana	1,550	1,290	1,850	1,800	1,490	2,230
Ohio	1,475	1,215	1,845	1,725	1,410	2,210
Northwestern Pennsylvania and Pittsburgh	1,320	1,005	1,795	1,630	1,290	2,065

* Included for full year tonnage men. Data are not available to show averagn earnings per start. The figure for Illinois would be increased if the computatiowere made without including the Northern Illinois districts where mining condi tions are very difficult.

year on the payroll of any one mine. If these men received pay in each of the 24 payroll periods they were considered full-year employees. Obviously this gives not only a selected group of employees, but a selected group of mines. However, for the year

under consideration such a group must be regarded as representing somewhat the maximum earnings opportunity in mining in a given area.

In the Central Competitive Field the earnings of these full-year employees were as shown in table 36.

The full-year mines operated an average of 177 starts in Illinois, 195 in Indiana, 193 in Ohio, 189 in northwestern Pennsylvania and Pittsburgh.

In a year of operation as depressed as 1921 it is possible that men working 24 pay periods were at mines with the most favor-

TABLE 37

Average starts of all mines tabulated in given area as compared with the average starts of mines with 24 pay periods of operation

AREA	AVERAGE STARTS OF ALL MINES TABULATED IN THIS AREA	24 PAY PERIOD MINES		
		Average number of starts	Percentage of operation *above* average of all mines	Percentage of total mines tabulated in this area
Illinois	162	177	9.3	66.9
Indiana	147	195	32.7	37.3
Ohio	152	193	27.0	31.5
Northwestern Pennsylvania and Pittsburgh	140	189	35.0	37.4

able operation. That this was true is shown by the average starts of all mines tabulated as compared with the average starts of mines with 24 pay periods of operation.

West Virginia. As classified for this study, West Virginia had, in 1921, four predominantly union and eight predominantly non-union sub-divisions. The union areas are part of Fairmont, Panhandle, Kanawha and New River; the eight non-union are Cumberland-Piedmont,[8] part of Fairmont, part of Panhandle, Kenova-Thacker, Tug River, Pocahontas, Winding Gulf and Logan. The total number of tonnage men whose names appeared

[8] Cumberland-Piedmont is classed as non-union here because the operators had no contract with the United Mine Workers, although many of them operated under an agreement fixing working conditions that was carried over from the war and although they paid the union scale.

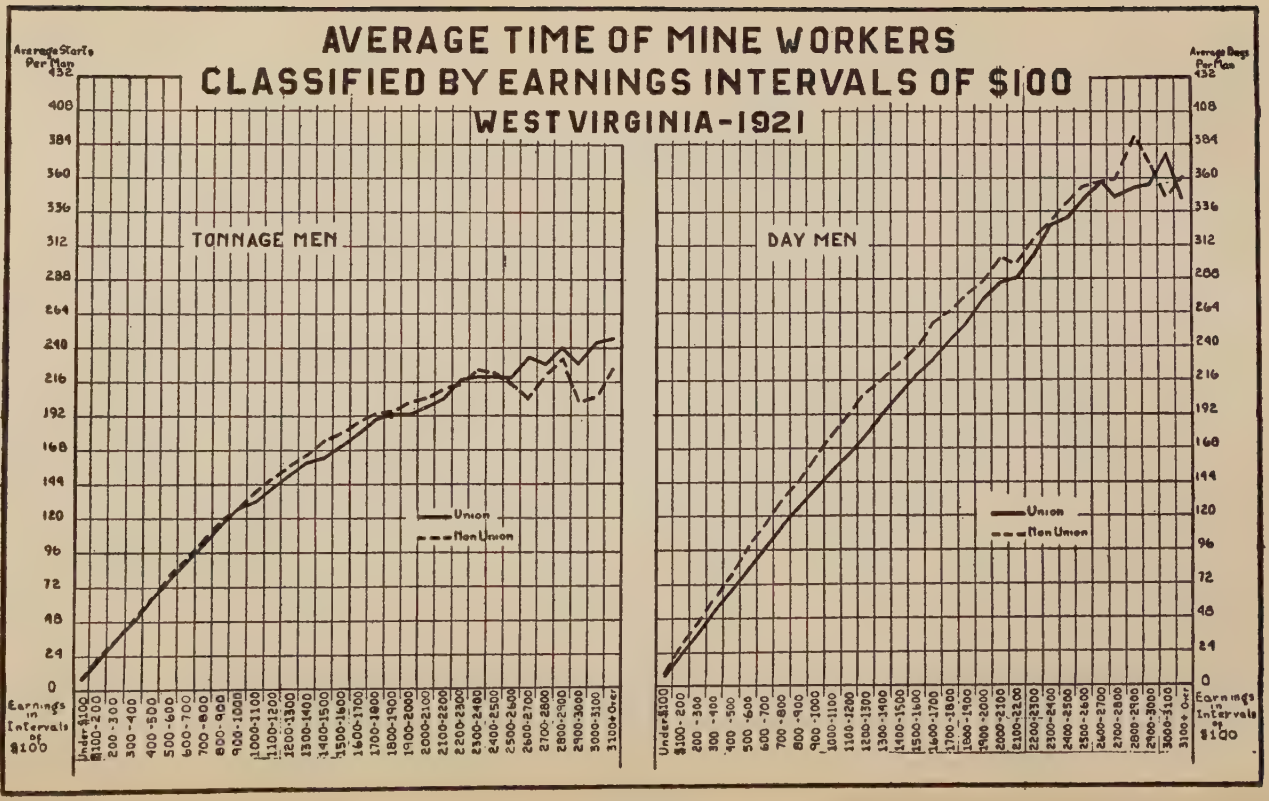
AVERAGE TIME OF MINE WORKERS
CLASSIFIED BY EARNINGS INTERVALS OF $100
WEST VIRGINIA-1921
TONNAGE MEN
DAY MEN
Average Starts Per Man
Average Days Per Man
Union
Non Union
Earnings in Intervals of $100
Under $100
$100 - 200
200 - 300
300 - 400
400 - 500
500 - 600
600 - 700
700 - 800
800 - 900
900 - 1000
1000 - 1100
1100 - 1200
1200 - 1300
1300 - 1400
1400 - 1500
1500 - 1600
1600 - 1700
1700 - 1800
1800 - 1900
1900 - 2000
2000 - 2100
2100 - 2200
2200 - 2300
2300 - 2400
2400 - 2500
2500 - 2600
2600 - 2700
2700 - 2800
2800 - 2900
2900 - 3000
3000 - 3100
3100 + Over

CHART 14

on the payrolls of the union mines during the year was 33,290, and the average number employed was 15,935. The total number on the payrolls of the non-union mines was 36,565, and the average number employed 13,662.

The curves in the left half of Chart 14 show how marked is the correspondence of average time worked to earn a given amount in the union and non-union areas of West Virginia. So far as tonnage men are concerned, up to the $1000 earnings group, the differences in average starts in the two groups are so slight as to be insignificant. From $1,000-$2,200 there is a difference of 3 to 11 days in favor of the union fields. Above $2,200, with two

TABLE 38

Average earnings per 8-hour day for day men—in 1921

WEST VIRGINIA	INSIDE	OUTSIDE	TOTAL
Union	$6.97	$6.84	$6.92
Non-union	6.23	5.64	6.03

exceptions, the number of starts is less for non-union workers, in some cases markedly less. The average earnings per start are substantially the same for the union and non-union group, amounting to $7.85 for the union and $7.76 for the non-union. In connection with this comparison it should be noted that in both union and non-union areas of West Virginia, earnings per start average higher than in the unionized area of western Pennsylvania and almost as high as in the combined Ohio district.[9]

When one considers the day men in this grouping for West Virginia, there is a wider difference between union and non-union in earnings opportunity in the same working time. With few exceptions, day men average more days in the non-union group in each $100 earnings class than in the union group. From $800 to $1,800, inclusive, the difference in average days per man amounts to 20 days or over, and in one interval averages as high as 30 days. This variation is shown in table 38.

[9] While rates of pay have remained stationary since 1920 in the union fields there has been a considerable reduction of rates during and since 1921 in non-union areas. For discussion see pp. 179-185.

The annual earnings depend, of course, upon the number of days of operation as well as upon daily earnings. The earnings of the median tonnage man of the non-union full-year group was $100 above that of the union group. This is a case where the difference in operation more than offsets the slight difference in daily earnings for tonnage men, but was not sufficient in the case of day men to offset the disadvantage of lower average daily earnings.

TABLE 39

Full year men

WEST VIRGINIA	TONNAGE MEN			DAY MEN		
	Median	Quartile		Median	Quartile	
		Lower	Upper		Lower	Upper
Union	$1,360	$1,070	$1,765	$1,545	$1,235	$1,950
Non-union	1,460	1,160	1,795	1,490	1,165	1,875

TABLE 40

WEST VIRGINIA	AVERAGE STARTS OF ALL MINES TABULATED IN THIS AREA	24 PAY PERIOD MINES		
		Average number of starts	Percentage of operation *above* average of all mines	Percentage of total mines tabulated in this area
Union	150	196	30.0	30.2
Non-union	176	212	20.5	57.1

In 1921 the non-union mines operated more continuously than the unionized for 24 pay period mines as well as for all mines tabulated.

Pennsylvania. Pennsylvania has two union fields with an average of 46,435 tonnage miners tabulated at the 362 mines included in the Earnings Study. Five important non-union areas are represented by 271 mines, with an average of 25,154 tonnage men. One of the union fields, northwestern Pennsylvania, was discussed in the analysis of the Central Competitive Field; the other is central Pennsylvania, an area where rigid boundaries between union and non-union mines cannot be made. The non-union fields

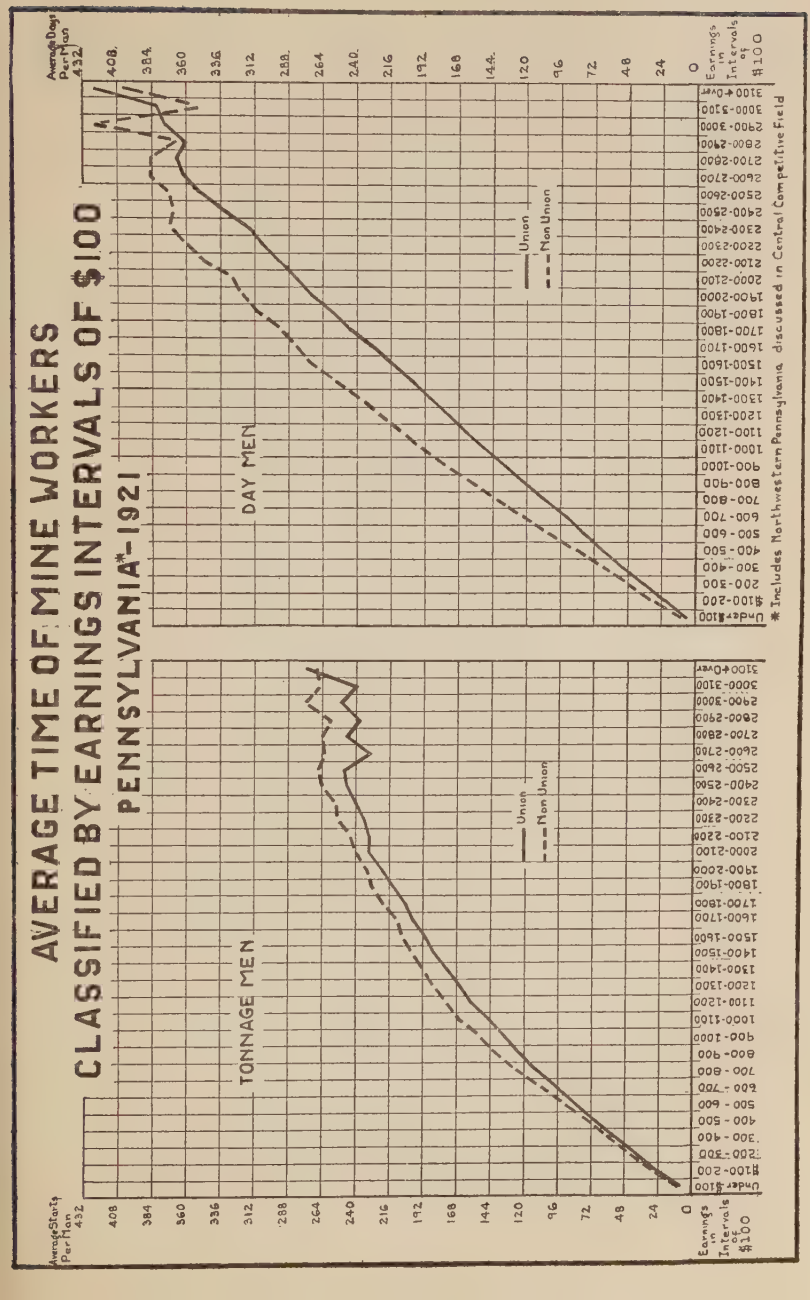
AVERAGE TIME OF MINE WORKERS
CLASSIFIED BY EARNINGS INTERVALS OF $100
PENNSYLVANIA-1921
TONNAGE MEN
DAY MEN
Union
Non Union
Average Days Per Man 432
Earnings Intervals of $100
Under $100
$100-200
200-300
300-400
400-500
500-600
600-700
700-800
800-900
900-1000
1000-1100
1100-1200
1200-1300
1300-1400
1400-1500
1500-1600
1600-1700
1700-1800
1800-1900
1900-2000
2000-2100
2100-2200
2200-2300
2300-2400
2400-2500
2500-2600
2600-2700
2700-2800
2800-2900
2900-3000
3000-3100
3100 & Over
* Includes Northwestern Pennsylvania, discussed in Central Competitive Field

CHART 15

comprise the Connellsville region, Westmoreland, Somerset, part of central Pennsylvania and a scattered group of mines outlying the Pittsburgh area. Owing to the number of miners involved in bituminous mining in Pennsylvania, the largest tonnage-producing State in the country, the figures of earnings are of special significance.

Chart 15, to simplify the comparison, has one curve combined for all tonnage men in the unionized mines studied, compared with a similar curve for all non-unionized mines. It will be seen from the space between the curves that differences in the possibility of earnings in the same working time is measurably greater than the differences found in West Virginia between union and non-union groups. In the non-union mines the average time is

TABLE 41

PENNSYLVANIA	TONNAGE MEN		
	Pick miners	Loaders	Total tonnage*
Union	$7.10	$6.80	$7.15
Non-union	6.39	6.31	6.54

* The figure for total tonnage includes earnings of machine miners which raises the rate for tonnage men considerably.

higher in every earnings group, with three or four minor exceptions in the upper earnings classes, where numbers involved are small. Computation of the average earnings per start gives $7.15 for union tonnage men, with $6.54 for non-union tonnage men.

If one compares the curve of the average days for day men in the union areas of Pennsylvania with that of the unionized grouping for West Virginia, it will be apparent that the curves conform very closely. When one considers non-union day men the difference between the union and non-union curves in Pennsylvania is even greater than the variations already cited in West Virginia. The spread between the two curves on Charts 14 and 15 visualizes this difference.

Quantitatively, the advantage in favor of union day men is shown by an average daily earnings figure of $7.09 for union against $5.57 for non-union.

Thus day men in non-union Pennsylvania averaged 46 cents per day, roughly, six cents per hour, less than in non-union mines of West Virginia.

Despite the difference in earnings per start, full-year tonnage men received higher annual earnings in the non-union than in the union part of Pennsylvania, as shown by the median and quartiles.

TABLE 42

Average earnings per 8-hour day for day men—in 1921

PENNSYLVANIA	INSIDE	OUTSIDE	TOTAL
Union	$7.36	$6.67	$7.09
Non-union	5.78	5.17	5.57

TABLE 43

Full year men

PENNSYLVANIA	TONNAGE MEN			DAY MEN		
	Median	Quartile		Median	Quartile	
		Lower	Upper		Lower	Upper
Union	$1,235	$945	$1,665	$1,660	$1,220	$2,140
Non-union	1,345	1,070	1,730	1,530	1,225	1,850

TABLE 44

PENNSYLVANIA	AVERAGE STARTS OF ALL MINES TABULATED IN THIS AREA	24 PAY PERIOD MINES		
		Average number of starts	Percentage of operations *above* average of all mines	Percentage of total mines tabulated in this area
Union	145	190	31.0	42.3
Non-union	183	229	25.1	48.0

Annual earnings for full-year day men ranged higher in 1921 than for tonnage men, though in this case the difference in total working opportunity for day men in non-union fields was not great enough to offset the lower daily earnings. The median is $130 higher in the union than in the non-union group.

In making these summaries important differences in daily earn-

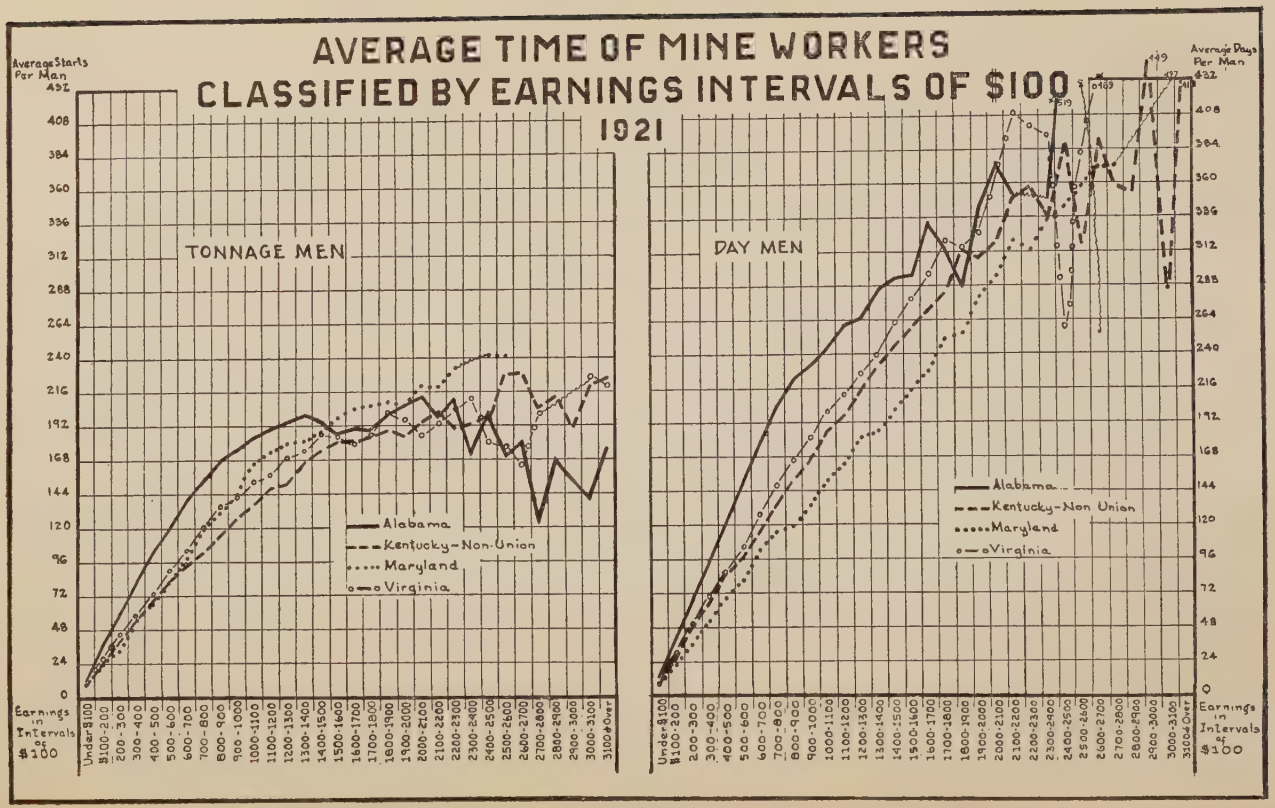
AVERAGE TIME OF MINE WORKERS
CLASSIFIED BY EARNINGS INTERVALS OF $100
1921
TONNAGE MEN
DAY MEN
Average Starts Per Man
Average Days Per Man
Earnings in Intervals of $100
Alabama
Kentucky-Non-Union
Maryland
Virginia

Chart 16

ings are obscured. Not only is there variation from district to district, but the earnings from mine to mine in the same district are often very dissimilar.

Southeast non-union areas. East of the Mississippi, the major non-union areas not already discussed are found in the southeast in Alabama, eastern Kentucky, Maryland,[8] and Virginia. In these four States earnings were summarized for 196 mines, employing an average of 17,467 tonnage men and 14,544 day men—36.7 per cent of the tonnage men were in Alabama, 32.8 per cent in Kentucky, 8.9 per cent in Maryland and 21.6 per cent in Virginia.

The tonnage curves shown on Chart 16 are erratic, owing to the inclusion of contractors.[10] The Alabama curve, in intervals below $1,500, shows the lowest average earnings per start. Above

TABLE 45

Average earnings per start for tonnage men—in 1921

AREA	PICK MINERS	LOADERS	TOTAL TONNAGE
Alabama	$5.42	$4.71	$5.17
Eastern Kentucky	7.32	7.18	7.44*
Maryland	7.34		7.31
Virginia	6.73	6.74	6.82*

* The figure for total tonnage includes earnings of machine miners which raises the rate for tonnage men considerably.

$2,300 the curve sweeps below the curves of the other districts and remains low in all the upper earnings classes. The curves for Maryland and Virginia cross and recross each other, while the Kentucky curve appears below the others in intervals less than $2,000.

The average earnings per start for tonnage men indicate the wide differences in these States. Tonnage men in Kentucky and Maryland average higher than in either of the union areas of Pennsylvania, but are below both the non-union and union groups for West Virginia. In table 45, showing average earnings

[10] The earnings of these contractors include a margin of profit and should be excluded in order to make occupations comparable with the classification in other areas.

per start, Kentucky tonnage men rank highest, Maryland second, with Alabama lowest. When the individual occupations are considered, pick miners earned about the same in Maryland as in the

TABLE 46

Average earnings per 8-hour day for day men—in 1921

AREA	INSIDE	OUTSIDE	TOTAL
Alabama	$3.93	$3.83	$3.90
Eastern Kentucky	5.87	5.42	5.71
Maryland	7.27	6.65	7.02
Virginia	5.49	4.93	5.30

TABLE 47

Full year men

AREA	TONNAGE MEN			DAY MEN		
	Median	Quartile		Median	Quartile	
		Lower	Upper		Lower	Upper
Alabama	$930	$720	$1,150	$800	$640	$1,000
Eastern Kentucky	1,330	1,025	1,745	1,415	1,150	1,710
Maryland	1,545	1,280	1,800	1,780	1,590	2,050
Virginia	1,200	940	1,500	1,180	950	1,430

TABLE 48

AREA	AVERAGE STARTS OF ALL MINES TABULATED IN THIS AREA	24 PAY PERIOD MINES		
		Average number of starts	Percentage of operation *above* average of all mines	Percentage of total mines tabulated in this area
Alabama	180	199	10.6	62.3
Eastern Kentucky	170	207	21.8	47.6
Maryland	151	231	53.0	34.6
Virginia	174	179	2.9	81.8

Kentucky fields, the difference in the totals being due to the earnings of machine cutters.

Day Men. Curves for day men scatter all over the page. The highest average daily earnings occur in Maryland. In one part

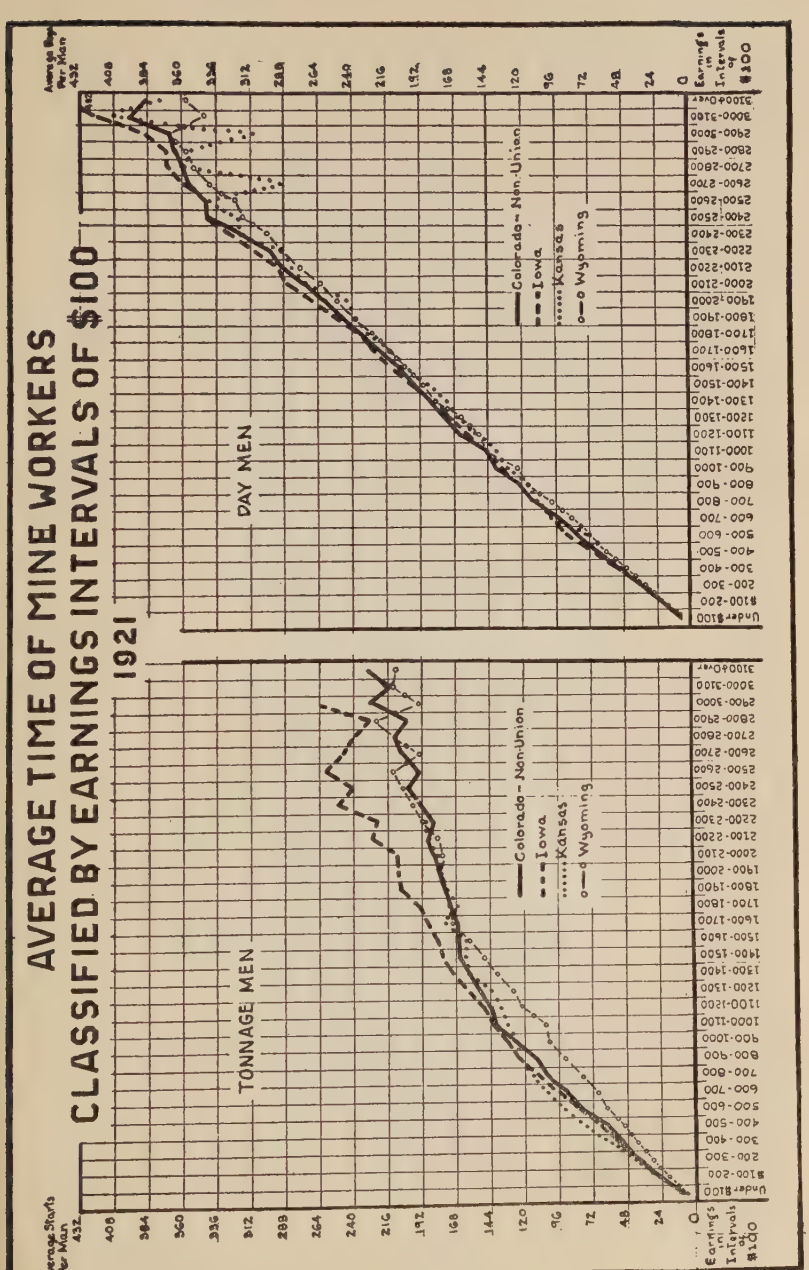
AVERAGE TIME OF MINE WORKERS
CLASSIFIED BY EARNINGS INTERVALS OF $100
1921
TONNAGE MEN
DAY MEN
Colorado - Non-Union
Iowa
Kansas
Wyoming
Average Hours Per Man 432
Earnings Intervals of $100

CHART 17

of Chart 16 the variation in time worked between the low point in Maryland and the high point in Alabama is as great as 100 days for the same earnings interval.

Despite the importance of the Kentucky fields, the number of full-year men was too small to afford adequate conclusions of annual earnings. Moreover, the tabulation only covered 30 per cent of the mine-workers in Kentucky, and the figures given here are cited with reservations.

The average daily earnings refer to all mines tabulated, the annual earnings to the mines which afforded employment during some part of each of 24 pay periods. The relation of the mine time of all mines to that of the selected group of 24 pay period mines is summarized in table 48.

Four States west of the Mississippi. Wage rates and earnings are of special interest in some of the States west of the Mississippi, such as Washington, Oklahoma and New Mexico, owing to peculiar circumstances of market competition. However, this summary can deal only with earnings in the four States with largest tonnage output; that is, Colorado,[11] Iowa, Kansas and Wyoming. Iowa has 32.5 per cent of the 15,580 average tonnage men tabulated for these areas, Colorado 28.4, Wyoming 22.4 and Kansas 16.7.

The relation of the districts changes somewhat as the curves of earnings and average starts of tonnage men are followed on Chart 17. Above $800 Iowa has the highest number of average starts required to earn a given sum; below $800, Kansas; up to $2,200, with little exception, Wyoming shows the lowest number of starts for each $100 interval of earnings. The average earnings per start for tonnage men is highest in Wyoming and lowest in Kansas. The figures were: Colorado $8.11, Iowa $7.46, Kansas $7.12, Wyoming $10.13. The average earnings for tonnage men in Wyoming is higher than for tonnage men in any other State discussed in this summary; Colorado (non-union) ranks next to Indiana. The Iowa rate is very close to that in eastern Kentucky. Kansas, the lowest of the four western States, is just below the

[11] The union mines in Colorado are not included in this summary.

average earnings per start for the unionized group in Pennsylvania.

The average daily earnings of all day men is highest in Wyoming, next highest in Kansas and lowest in Iowa. The curves

TABLE 49

Average earnings per 8-hour day for day men—in 1921

AREA	INSIDE	OUTSIDE	TOTAL
Colorado	$7.46	$6.89	$7.19
Iowa	7.23	6.92	7.15
Kansas	7.81	7.27	7.63
Wyoming	7.97	7.41	7.72

TABLE 50

Full year men

AREA	TONNAGE MEN			DAY MEN		
	Median	Quartile		Median	Quartile	
		Lower	Upper		Lower	Upper
Colorado	$1,520	$1,200	$1,900	$1,780	$1,430	$2,260
Iowa	1,275	1,030	1,610	1,580	1,240	1,980
Kansas			No full year men			
Wyoming	1,880	1,640	2,340	2,125	1,805	2,505

TABLE 51

AREA	AVERAGE STARTS OF ALL MINES TABULATED IN THIS AREA	24 PAY PERIOD MINES		
		Average number of starts	Percentage of operation *above* average of all mines	Percentage of total mines tabulated in this area
Colorado	176	202	14.7	61.2
Iowa	169	188	11.2	63.8
Kansas	147			
Wyoming	185	202	9.2	71.8

show that the conclusion here drawn is oversimplified, since the Colorado and Iowa curves follow each other closely up to $1,300. In the upper intervals the average days worked per $100 earned are highest in Iowa.

In 1921 the earnings of full-year men, both tonnage and day, were higher for Wyoming than for any State studied.

Table 51 furnishes a comparison of 24 pay period mines with other mines included in the 1921 tabulation.

For the 24 pay period mines, Colorado and Wyoming average the same number of starts, though the difference in median earnings is $360 in favor of Wyoming tonnage workers.

Comparison of earnings at identical mines in 1920 and 1921. Too unfavorable a picture of the earnings of bituminous miners is given by data of the depression year 1921, even when the 24 pay period men alone are considered. Comparison of identical mines for 1920 and 1921 brings out somewhat the understatement of earnings in the 1921 figures.

Northeast union area. It will be recalled that for the four States in the Central Competitive Field the lowest median earnings for full-year tonnage men, in 1921, were $1,320 in the Pittsburgh area; the highest $1,550 in Indiana. Of the 53 mines for the northeast area included in the sample, some of which were in central Pennsylvania, the median was $1,430 in 1921, and $2,030 in 1920, a difference of 42 per cent. The median, however, does not fairly bring out the wide differences in income of the workers. While in 1920 only three per cent of the tonnage men received less than $1,100, the percentage with less than that amount in 1921 reached 26.5.

In both years the range of earnings for full-year men is very wide; even in 1920, 10 per cent of the piece workers on the rolls for every pay period received less than $1,400, while more than 20 per cent received above $2,400, with 5 per cent of the men in income groups of $3,000 and over. While the earnings of more than 50 per cent of the tonnage men were above $2,000, the problem of irregular operation, which kept 10 per cent of the full-year men in income groups below $1,400, even at these well-established mines, in a year of unusual activity in operations, must not be minimized. To be sure, in 1921 there were 48 per cent earning less than $1,400. The complexity of the interpretation of earnings data is illustrated by the fact that even in the depression year of 1921 regularity of operation at some mines

permitted 10 per cent to earn $2,200 or over, while 5 per cent earned $2,500 or over.

For day men the advantage of 1920 over 1921 was not so great as for tonnage men, chiefly, no doubt, because the high union scale for day men in force throughout 1921 was not adopted until mid-summer of 1920. The median reached $1,745 in 1921 and $1,910 in 1920, a difference of $165, or 9.5 per cent in favor of 1920.

Sixty-eight mines are covered for union areas of West Virginia. The median earnings for tonnage men for this group of mines were $615, or 49 per cent higher than the figure for the same mines in 1921, and $510, or 38 per cent higher than for all mines in this area tabulated for 1921.

TABLE 52

Full year men for union area of West Virginia

YEAR	TONNAGE MEN			DAY MEN		
	Median	Quartile		Median	Quartile	
		Lower	Upper		Lower	Upper
1920	$1,870	$1,595	$2,195	$1,710	$1,480	$1,960
1921	1,255	990	1,600	1,460	1,210	1,885
All mines 1921 (225)	1,360	1,070	1,765	1,545	1,235	1,950

Day men's median earnings were $250 or 17 per cent higher than for the 1921 sample, and $165, or 11 per cent higher than for all mines. It will be apparent from the comparison that the sample gives a poorer picture of earnings than the larger group in 1921, though the differences in average earnings per start for all tonnage men were not great. The figures were $7.71 in 1920, $7.97 in 1921 and $7.85 for the larger tabulation in 1921.

Forty-four mines in non-union fields of Pennsylvania are included in the 1920-1921 comparison.

Table 53 gives the differences in earnings of tonnage and day men.

The median for the sample for 1921 is within $15 of the median for all mines totalled in 1921 and, consequently, for this figure, the samples may be regarded as some index of earnings in

the two years. The median for tonnage men in 1920 was 61 per cent higher than the 1921 figure, and 38 per cent higher for day men.

West of the Mississippi the 1921 sample is fairly adequate to show the differences in earnings due to the depression year. For 31 mines that may be regarded as comparable with the Colorado non-union mines, earnings were as shown in table 54.

TABLE 53

Full year men for non-union areas of Pennsylvania

YEAR	TONNAGE MEN			DAY MEN		
	Median	Quartile		Median	Quartile	
		Lower	Upper		Lower	Upper
1920	$2,195	$1,850	$2,560	$1,955	$1,670	$2,260
1921	1,360	1,075	1,640	1,420	1,075	1,790
All mines 1921 (271)	1,345	1,070	1,730	1,530	1,225	1,850

TABLE 54

Full year men for non-union areas of Colorado

YEAR	TONNAGE MEN			DAY MEN		
	Median	Quartile		Median	Quartile	
		Lower	Upper		Lower	Upper
1920	$2,330	$1,940	$2,780	$1,995	$1,795	$2,220
1921	1,460	1,185	1,795	1,680	1,395	2,120
All mines 1921 (49)	1,520	1,200	1,900	1,780	1,430	2,260

There is only 10 cents difference in the average earnings per start of tonnage men between the sample group and all mines in 1921. To be exact, average earnings per start were $8.05 in 1920, $8.01 in the 1921 sample and $8.11 for all mines tabulated for 1921. The median for the 1921 sample is $60 lower than that of all mines. The 1920 median was 60 per cent higher than that for 1921 and 53 per cent higher than the median for the comprehensive tabulation.

For a selected group of mines in 1921 and 1920 a somewhat more detailed comparison can be given for a non-union area in

Pennsylvania and another in Maryland since the time of 24 pay period men was totalled as well as the earnings. In the Pennsylvania area full-year tonnage men at identical mines averaged 150 starts per man in 1921 against 232 in 1920. The average annual (arithmetic average) earnings amounted to $1,158 in 1921 against $2,131 in 1920.

It should be noted that in 1920 the average and median fall in the same earnings class, whereas the median is lower than the average in 1921. Full-year day men in this area averaged 219 days in 1921, with 289 in 1920. The average annual earnings were $1,425 and $1,935, respectively.

TABLE 55

Full year men

	TONNAGE MEN			DAY MEN		
	Median	Quartile		Median	Quartile	
		Lower	Upper		Lower	Upper
Pennsylvania:						
1920	$2,122	$1,804	$2,453	$1,901	$1,630	$2,188
1921	1,077	911	1,319	1,245	1,023	1,834
All 1921	1,280	1,020	1,605	1,440	1,145	1,875
Maryland:						
1920	1,815	1,590	2,015	1,675	1,520	1,890
1921	1,500	1,285	1,705	1,690	1,540	2,000
All 1921	1,545	1,280	1,800	1,780	1,590	2,050

In Maryland the full-year tonnage groups, mainly pick miners, averaged 204 starts in 1921 and 232 in 1920. Average annual earnings were $1,500 in 1921, $1,801 in 1920—a difference of $301, or 20 per cent. (It was necessary to total the earnings figures, since the number of men was too small to use the midpoint of the interval.)

The difference in the average earnings of day men in the two years was only $62, and that in favor of 1921. The day men had $1,782 in 1921 and $1,720 in 1920.

The figures totalled for earnings introduce a complexity that

makes generalizations of earnings on the basis of partial data unsafe. Not only do full-year men work more starts but their

TABLE 56

Comparison of average daily earnings for identical mines in 1920 and 1921

OCCUPATION	MARYLAND		PENNSYLVANIA	
	1921	1920	1921	1920
Tonnage:				
Machine miners	$8.48	$7.73	$9.92	$10.75
Pick miners	7.13	7.29	7.15	8.17
Loaders	5.96	6.77	7.53	8.93
Outside:				
Blacksmiths	7.32	6.21	7.18	7.33
Carpenters	7.20	6.26	6.67	6.83
Engineers	7.38	6.37	6.85	6.41
Firemen	7.12	6.09	6.52	6.54
Stablemen	5.99	4.78	5.92	4.55
Laborers	5.84	5.50	5.42	5.62
Miscellaneous	6.68	5.50	5.91	5.69
Inside:				
Brakemen	7.23	6.16	6.90	7.06
Bratticemen	7.29	6.30	6.32	6.96
Cagers	7.31	5.87	7.39	6.76
Door-tenders	5.90	4.98	3.65	4.17
Drivers	7.27	6.36	6.51	6.23
Electricians	7.24	6.30	7.18	7.61
Motormen	7.45	6.42	7.27	7.42
Pumpmen	6.33	5.50	7.24	7.56
Timbermen	7.29	6.26	6.58	7.59
Trackmen	7.35	6.33	6.64	7.18
Laborers	6.40	6.30	5.59	6.29
Miscellaneous	7.32	6.42	7.00	6.73
Total tonnage	7.10	7.28	7.44	8.60
Total outside	6.76	5.78	6.15	6.01
Total inside	7.25	6.30	6.75	7.03
Total day men	7.05	6.10	6.51	6.62
Total full year tonnage	7.36	7.77	7.72	9.17
Total full year day	7.02	6.16	6.52	6.68

average earnings per start frequently reach a figure higher than the average per start made by all men on the roll when the short

service groups are considered. Because these figures for tonnage men are of special significance the averages are repeated here.

The difference for day men is not great enough to have significance. It should not be overlooked that full-year men have varying opportunities for employment and that there is a wide

TABLE 57

Average earnings per start

	PENNSYLVANIA		MARYLAND	
	1921	1920	1921	1920
Full year tonnage men	$7.72	$9.17	$7.36	$7.77
Total tonnage men	7.44	8.60	7.10	7.28

range between the time worked by men in the lower earnings classes and that worked by men in the upper earnings classes. This is true in 1920 as well as in 1921.

Note: In the 1920 comparison the area called West Virginia had 67 mines in West Virginia and one in western Kentucky. In the Pennsylvania group there were 40 in Pennsylvania and 4 in Ohio; in the Colorado group, 27 in Colorado, 3 in New Mexico and 1 in Utah.

CHAPTER VI

Causes of Strikes[1]

The close connection between coal shortages and general strikes or suspensions led the Commission to make a close investigation of labor relations in the bituminous coal industry. The emphasis in this part of the Commission's work fell upon proposals for making more effective the workings of wage agreements and especially their renewal without stoppage of work.

A corps of investigators experienced in industrial relations spent three months in the field to learn by direct contact with operators and miners and inquiry from them and their representatives the manner and spirit in which relationships function from day to day. Special attention was given to the larger issues which come up in connection with the renewing of agreements and give rise to the danger of national strikes.

Economic factors affecting labor relations. Between seventy and eighty per cent of the cost of bituminous coal at the mine is the labor cost. Differences in wage scales are likely to affect both labor cost and miners' earnings and consequently labor relations. Out of this set of facts grows the real significance of the competition between coal fields in which the workers are unionized and coal fields in which the workers are not unionized.

The chief union fields extend from the Pittsburgh region of western Pennsylvania, through Ohio and Indiana to Illinois. A second center of unionism is the southwestern interstate field, lying between Iowa and northern Texas and consisting of Arkansas, Kansas, Missouri and Oklahoma. East of Pittsburgh lie the vast coal fields of central Pennsylvania, 80 per cent unionized, accord-

[1] In this summary are included a summary of the study, "Labor Relations in Bituminous Coal Mining," by Henry S. Dennison, Willard E. Hotchkiss, and Joseph H. Willits; and a summary of the study of "Violence and Abridgment of Civil Liberties," prepared under the direction of Commissioner Thomas R. Marshall by Judge Dan Link.

ing to an official of the Central Pennsylvania Operators' Association.[2] In addition to these union fields, there should be added the mines of Iowa, which are organized, the union fields of Wyoming and Montana and Texas, the organized fields of Michigan and western Kentucky, the Fairmont district and a few other scattered areas in West Virginia. The union organization divides these unionized areas into districts, which not infrequently coincide with State boundaries.

The effective strength of the union is in the Central Competitive Field, which includes Illinois, Indiana, Ohio and the Pittsburgh region of western Pennsylvania. The Central Competitive Field employs one-third of the workers of the industry. It is completely organized, and the tradition of unionism goes back to the middle of the nineteenth century.

In this stronghold of unionism wage rates and other conditions of work are arrived at by collective bargaining. Biennially, and in recent times annually, representatives of the union and the operators of the Central Competitive Field have met in joint conference to fix wage rates and other conditions of employment. These conferences are ordinarily composed of sixty-four delegates, eight operators and eight miners, representing each of the four districts of the Central Competitive Field.[3] Each State is given eight votes, which are divided equally between the operators' and miners' delegations. All matters affecting the proposed wage scale and agreement become binding only when carried by a unanimous vote. The actual work of negotiation is delegated to a group of eight, called the scale committee, consisting of two representatives from each State. The agreement finally reached by the two sides is signed and becomes the "agreement" or "contract" under whose terms the two parties agree that their relations shall be governed.

[2] The paid up memberships in this area, from figures supplied by the United Mine Workers, include between fifty and sixty per cent of the total workers of the district.

[3] Western Pennsylvania did not come into the conference which resulted in the Central Competitive Field agreement of April 1, 1923, but signed a separate agreement.

This collective contract fixes the tonnage rates,[4] not for the entire region, but only for basing points in each of the four districts—that is to say, rates are set for the Hocking Valley subdistrict of Ohio, for the thin vein mines in western Pennsylvania, for the Danville district in Illinois and for the bituminous mines of Indiana. Subsequent to the joint conference of the four States the representatives of the four regions hold separate meetings and agree upon rates fixing differentials above or below the rates agreed upon for the basing points.

For the last twenty-five years the wage level established by the agreement in the Central Competitive Field has determined the wage levels of the other organized bituminous districts. The numerous wage increases and the single wage decrease of 1904 in the Central Competitive Field have, for the most part, been reflected in similar changes in the contracts of other union districts. Indirectly, it has influenced the wages of non-union fields.

After these union contracts are signed, the administration of the terms becomes the joint responsibility of the operator and the union organizations and the representatives in the respective districts.

Thus, the present system of agreements with the agreement in the Central Competitive Field constituting the base agreement, arose from a desire to limit the destructiveness of the competition between mines in order that a wage war that led to a wage scale below the proper level of subsistence for the miners and a price war that led to red figures and bankruptcy for operators might be avoided. The importance of the relative wage levels stands out when we repeat that between seventy and eighty per cent of the total cost of producing bituminous coal is the labor cost. Unlike the union fields, the non-union fields have the advantage of a flexible wage scale; they can adjust wages to the condition of the market.

No such freedom of action exists for the operators in the union fields, where only one cut of wages has ever been made for the whole region. The advantages to the non-union fields of rates of

[4] Approximately 60 per cent of the men and boys employed in and around the bituminous coal mines are tonnage men.

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pay that are lower, of freedom to adjust wages to market conditions and, in addition, of a reasonable guarantee from general strikes, have more than offset the advantage of the union fields in being located nearer the market.

"That these advantages were effective in promoting the growth of the non-union mines at the expense of the union mines may be seen by comparing the relative position of the two groups in 1898 and in 1914. Whereas, during this period, southern Ohio declined notably in relative importance among the fields of the Appalachians competing in western markets, and whereas the Pittsburgh district also lost in relative standing, shipments from northern West Virginia increased; the non-union regions of eastern Kentucky were developed with extraordinary rapidity; and an entire new field—Logan County, West Virginia, coming into first production in 1905—had taken rank as one of the most productive districts of the country by 1914. Twenty years ago the coals of Hocking Valley, Fairmont, Pittsburgh and eastern Ohio were regularly quoted on the Chicago market. Today Pittsburgh has entirely disappeared from the Chicago market and the other coals mentioned are represented only by occasional shipments. In 1898 86 per cent of the coal shipped up the Lakes originated in the union districts of Pittsburgh and Ohio. In 1913 their share had dropped to 67 per cent. In 1898 southern West Virginia shipped to the lakes only 40,000 tons, or less than 1 per cent of the total. In 1913 its contribution ran over 6,000,000 tons, or 23 per cent of the total. Non-union eastern Kentucky first broke into the lake trade in 1909, with shipments of 7,000 tons; since then its share has increased by leaps and bounds until in 1921 the district supplied 2,600,000 tons.

"Not all of these shifts in production are due to the labor policy of the non-union fields. In part, they represent the natural rapid growth of young districts as opposed to the stationary or even declining production of districts where the available coal had been thoroughly staked out years ago as, for example, in southern Ohio. In large part, also, the union Appalachian coal from the Chicago market was displaced not by non-union coal, but by coal from the rapidly developing union field of southern Illinois, which

has grown at a prodigious rate, exceeded by few other districts of the country. And, finally, part of the apparent displacement is due to the completion of through railroad routes across the southern mountains and to the extremely favorable freight rates offered by these long-haul carriers to stimulate traffic. With due allowance for these other factors, however, it is still true that the non-union fields have been greatly encouraged by the mere fact that they could keep their labor cost below the costs of the union shippers and that they were free to operate during strikes.

"These figures offer mute testimony to the silent pressure of non-union coal upon the business of the organized fields."[5]

Violence and abridgment of civil liberties. These economic factors explain in part the vigorous efforts of the United Mine Workers to unionize the non-union fields, the willingness of certain union operators to see the non-union fields organized and the determination of the non-union operators to keep their fields non-union. In these areas where grim determination to unionize is met with equally grim determination to keep the union out, a state approaching warfare develops and disregard of the law and of human and property rights becomes the common practice of either side.

The many charges of abridgment of civil liberties on the part of the operators and of violence by officials and members of the United Mine Workers of America led the Commission to institute a special inquiry into the cases of such disorder in the coal fields.

Particular attention was given to the disaster at Herrin, Illinois. The Commission regarded the massacre as a crime and the subsequent trials as a miscarriage of justice. But in an effort to explain the state of mind which brought about the Herrin disaster it stated:

> When mining began in that county it was upon a ruinously competitive basis. Profit was the sole object; the life and health of the employees were of no moment. Men worked in water half way up to their knees, in gas-filled rooms, in unventilated mines where the air was so foul that no man could work long without seriously impairing his health. There was no workmen's compensation law; accidents were frequent, and there

[5] Tryon, op. cit.

was no common ground upon which employer and employee could meet. They had no interests in common, and they regarded each other with hostility and distrust. The average daily wage of the miner was from $1.25 to $2.00. Then came the union in 1898 and 1899. Peace and goodwill and mutual respect have been the general rule since that time. The Workmen's Compensation Law was enacted. Earnings advanced to $7, and even to $15 a day; improvement in the working conditions was reflected in the appearance of the workmen, their families, their manner of life and their growing cities and public improvements. There are 13,000 miners in the county, 62 per cent of whom own their homes, and most of them own automobiles. All occupations are unionized. They believe in the union, for they think it brought them out of the land of bondage into the promised land when their government had been careless or indifferent to their needs. They hold themselves to be good Americans and proved it during the Great War, but what they have of daily comfort they think comes from the union and not from the government.

The Commission similarly gave attention in its study to conditions in the non-union areas of West Virginia, Kentucky and Pennsylvania. It pointed out that miners' organizations had existed in such areas prior to the war.

Of course, there are men in the non-union fields who desire the union. How many, nobody knows, nor will there be any way of telling until the rights of American citizens have not only been admitted, but have been guaranteed to them by the courts and officials of this country.

In connection with the competition of bituminous mines north of the Ohio River with the non-union mines in parts of West Virginia, Kentucky and Pennsylvania, the Commission said:

It was felt by union operators that the non-union mines either undersold them in the market or made a greater profit than their own and that this was due to cheaper labor. How far these operators desired the United Mine Workers to go in unionizing mines would be mere conjecture, but there is no doubt of their desire to equalize conditions by bringing the non-union mines under union control. That vast sums of money have been spent in this effort; that rioting and bloodshed and destruction of property have taken place is beyond doubt. For years the controversy has gone on. The area of greatest civic disturbances has been the counties of Mercer, McDowell, Mingo, Wayne, Boone, Logan and Kanawha, in West Virginia, and the counties of Johnson, Pike, Harland and Bell, in Kentucky. All of these counties are mountainous, underlaid with rich veins of coal. They were almost exclusively peopled

by mountaineers, native whites of ancient American ancestry. They were a law unto themselves. Their annals are crimson with feuds and the gun was the "Supreme Court." The coal-mining industry has introduced large numbers of negroes, as well as foreign-born and native whites from other sections of the country; still the local traditions exert a dominating influence and account very largely for the outbreaks of violence. Much of this violence had nothing to do with the coal industry, but had to do with the nature and racial characteristics of the people, yet it has furnished excellent argument for one side or the other. The primitive conditions of life of this people can scarcely be paralleled anywhere, unless in the mountains of North Carolina and Tennessee. . . .

There were serious labor troubles in 1912-1913, after which there was a period of quiet until the extraordinary demand for coal during the World War. At the same time the union made elaborate preparations to unionize the unorganized fields. The topography of the country, the sparseness of the population, the isolation of the valleys one from the other, the general poverty of the counties, lack of level ground upon which to build towns, and the fact that mining machinery and equipment were usually on leased ground are all important factors in the situation. The operator had to establish his business where the coal was and bring his labor to it. He had to construct houses for his employees and furnish them with necessary appurtenances, such as water supply, and establish stores where they might purchase food and clothing. He arranged for medical attendance and hospital service, provided for schools and school houses, employed teachers, or, at least, paid part of their wages, and endowed churches and community buildings. Thus, it appears that each mine or group of mines became a social center, with no privately owned property except the mine, and no public places or public highways except the bed of the creek which flowed between the mountain walls. These groups of villages dot the mountain sides down the river valleys, and need only castles, drawbridges and donjon-keeps to reproduce to the physical eye a view of feudal days. There are no public corporations in many places to provide for the public welfare or to maintain law and order, so the mine owner had one of his employees deputized by the sheriff, and thus there came into existence the much-discussed "mine guard." As the employees were the only ones who were furnished homes, and their occupancy was contingent upon their employment, the courts of the state have decided that the relation of landlord and tenant did not exist, but that it was the relation of master and servant and when the employment ceased the mine owner came into possession of the house.

Thus the position of the miners in company-owned houses is anomalous. They are not tenants and have no more rights than a domestic servant who occupies a room in the household of the employer.

After its discussion of violence and abridgment of civil liberties in the coal fields, the Commission went on to say:

> The Commission reiterates that it is seeking something better for the future than the mere fixing of responsibility for past violations. It does not minimize the gravity of all sorts of crimes which have taken place. It cannot too strongly condemn the custom of permitting either operators or miners to furnish deputy sheriffs, policemen or other public officials not paid out of the public treasury. That state and local government has not risen to the level of the average idea of justice in America which has not both the will and the power to preserve the life and the property of its citizens.
>
> The Commission condemns equally that lax local government which has seemed to render it necessary for the owner of property to police it at his own expense and in the event of strikes to bring in professional strike breakers, who are frequently better gunmen than they are laborers, and the exercise of that right which inherently belongs to an American citizen, namely, that of a stranger voluntarily walking into a community, hiring a hall, and giving that community a lecture on what its rights and duties are. Many good-intentioned people, seeking to serve the common weal, have unwittingly contributed more to crime than to character-making.
>
> And finally, if neither the patriotism, private conscience, nor business common-sense of the industry shall lead all persons engaged in it not only to observe the law but to help enforce the law; and if state and local authorities shall be impotent in prosecuting and convicting violations thereof, then it is the solemn duty of the Congress of the United States to assume jurisdiction over these American rights, bringing the full power of the Union to their preservation by the prosecution and conviction of all persons, whether high or low, who shall dare to violate them.
>
> The Legislative, Judicial and Executive branches of this Government must not permit a Union of Operators, a Union of Miners, nor a union of both to become greater than the Union of the States.

Labor relations. The Commission's study of labor relations, as distinguished from its study of civil liberties, consisted mainly of an inquiry into the day-to-day relations between operators and miners, the factors that more immediately affect those relations and the procedure that governs them. It was, in addition, a study of some of the larger issues between employer and employee that come up in connection with the renewing of agreements and give rise to the danger of a national strike.

The Commission indicated that, in its judgment, the frequently recurring menace of a coal strike creates a condition that the public considers intolerable. It finds no reason to believe that the public's goal of a dependable supply of coal at reasonable price is inconsistent with reasonable conditions of life and citizenship for the miners or with a reasonable return on judicious investments for operators. It calls upon the operators and the union to set their houses in order as a price of continuing in the custody of those public interests with which they are now entrusted. The study was a plea for operators and union officials to show that quality of statesmanship, individually and collectively, essential to a frank meeting of the fundamental problems of the industry under a system of private operation. It has been indicated that simple general statements are inadequate to describe the present situations in bituminous coal mining when such a variety of natural and economic conditions hold. Equally varied are the conditions in labor relations, ranging on the one hand from the autocratic abuse of power by certain union officials, as in Kansas and at Herrin, to the autocratic abuse by certain non-union operators, as in West Virginia, on the other. The problems of non-union Alabama and union Illinois can hardly be described in the same terms, and there are all kinds of individuals on either side. One feature of the relations of operators and miners in the bituminous coal industry that may, however, be mentioned in general terms is the frequency with which these relations have been interrupted by strikes and suspensions. Reports of the Geological Survey show an annual loss of man-days ranging from 400,000 to 50,000,000, with loss of 2,000,000 or more man-days in 16 out of the 34 years, 1890-1923. In connection with these figures, the total number of man-days worked should be remembered; this in 1920 amounted to 141,600,000. It should also be remembered that the total time lost by strikes in the bituminous fields of the country from 1899 to 1921 was only 9.8 per cent of the idle time.

These strikes are of three main types, differing from each other in character, in effects on subsequent relations and on the public. They include: (a) strikes to secure a union agreement; (b) suspensions that occurred at the expiration of an agreement because

of failure of the two parties to agree on the terms of its renewal, and (c) local or petty strikes that occurred because of some minor grievance, frequently within a period during which relations were governed by the terms of an agreement, in which cases they were in violation of the agreement.

Strikes and the menace of strikes constitute a condition for which the public is anxiously seeking a remedy. But only the uninformed would assume that the remedy is so simple a matter as to be merely a question of ordering strikes stopped. The problem is to discover and correct the conditions that lead to and may even at times justify strikes and to find the procedure that has the best chance of deciding fairly and peacefully such matters of conflict.

Any consideration of the labor relations of today must take account of the influence exerted by labor relations of the past. In the earlier days of coal mining, power was predominantly on the side of the operator and abuse of that power was the frequent result. Over at least two-thirds of the coal fields this dominance by the operator has gradually given way before the rising power of the union until the original position of the two has frequently been reversed. The background of years of oppression, however, even where conditions may now be entirely altered, colors the mental attitude of the miner today so that the coal operator of today must pay an accumulated penalty resulting from the short-sighted labor policies of operators of the past.

The relation between employer and employee — or between operator and union—is in its very nature a continuing relation. For its efficiency and success it is dependent on co-operation between the two parties to the relation, just as is the domestic relation between husband and wife. Persons or groups bearing such a relation to each other do not work well together if they have to depend continuously on the instruments of the law to adjust their difficulties for them. Such a pass may be reached—may have already been reached in this industry—where there is no other course open. But unless we are ready to admit that the hope for the attainment of such better relations under private leadership is gone, the policy of encouragement of and appeal to the constructive elements among the operators and within the

union, supported by certain minimum assistance on the part of the public, would seem to offer the less spectacular, but more constructive way out.

And in its study the Commission found enough of such constructive elements to warrant the recommendation of such a policy. In accordance with this policy and in order to stimulate open-minded discussion and to encourage action, the Commission made specific suggestions of policy to the operators and to the union. These suggestions can be presented only in summary form under seven main headings:

1. Provocative Publicity.
2. Operator Management of Labor Relations in Individual Mines.
3. More Effective Collective Management of Labor Relations by Operators.
4. The Administration of Relations by the Union.
5. Problem of Non-union Fields.
6. Joint Adjustment Machinery, Including the Making of Agreements.
7. The National Strike and the Government Relation to Labor Relations.

(1) Provocative Publicity. The Commission recommended that each side place some check upon provocative and truculent publicity which tends to undermine good relations.

At the outset of its discussion of Labor Relations in the bituminous industry, the Commission pointed out the malign influence of unduly partisan propaganda and commented upon the gulf that often separates the publicly-expressed mind from the actual mind of the industry or of the union. Concrete incidents, true though they may be, but rarely typical, are made the subject of press articles and affidavits and hurled back and forth "ad nauseam" to show the snowy whiteness of "our" side and the black depravity of "yours." Little of this propaganda is helpful or constructive and little of it is relevant to the main issue of securing wholesome and efficient industrial relations in either the union or the non-union branches of the industry. It is true that this official propaganda contains many facts and many elements of truth. But they

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THE UNION CHECKWEIGHMAN

make that which is true of a part appear to be true of the whole. To imply that these incidents are true of the whole industry or anything like the whole industry creates an impression that is distinctly misleading.

For a time militant publicity may deceive the public and cause people to line up on one side or the other on the basis of partisan prejudice and without understanding of the issues involved. In the end, however, results of this kind largely neutralize each other and the thoughtful public becomes disgusted with both sides. When, to such disgust, is added the hardship of an interrupted fuel supply or a supply secured at burdensome cost, the setting is right for drastic action without too fine a regard for either the operators or the union. This is the end towards which destructive propaganda on both sides has been leading. Misleading statements tend to undermine good relations where they exist and in time may destroy the possibility of such relations. Unless each side will voluntarily place some check upon this sort of activity there must be reduced hope of such progress within the industry as will forestall drastic public action. Neither the operators nor the union can win the public solely by abusing the other side.

Suitable publicity is a proper agency of organization. Both operators and union should present their case to the public. In doing so they have an opportunity to render a real service, by acquainting persons outside the industry with some of the problems the groups within the industry are facing, and by interpreting, as no one else can, the hopes and aspirations of the people in the industry. Publicity carried on with this aim would not only inform the public of the facts, but it might make for a broader tolerance of divergent views.

(2) Operator management of labor relations in individual mines. Next to this recommendation would come the group of recommendations that had to do with the operator management of labor relations within the individual mines. The public is better acquainted and is more directly affected by the dramatic national strike, but in any constructive program we must frankly recognize that the starting point of all labor relations in the industry is at the individual mine. Therefore, the nature of the operator man-

agement of labor relations at the mine is of primary importance in determining whether the agreement between the two parties shall function smoothly, and whether the path of labor relations, as a whole, is to be rough or smooth. The connection between local mine management and the precipitation or avoidance of the national strike may be indirect, but it is very real. The national strike may be in part the explosion resulting from the accumulation of petty irritations and a downgrading of the day-to-day relations at the individual mine. These daily irritations do not directly create the national strike, but their presence or absence may be responsible for states of mind that determine whether there is to be a strike or not. Compared to other industries the coal industry has been remarkably slow to develop constructive policies, except as they have been forced upon it by the actual or potential presence of the union. No sound structure of labor relations may be developed unless the base is sound.

The Commission, therefore, recommended more serious concentration by individual companies upon the real psychology of men at work, especially noting the examples of the many companies which have established good relations. More specifically, it commended to the industry that policy which has been demonstrated to be sound in coal and in other industries as well—the policy in each company of centralized responsibility for labor relations.

The Commission called attention to the importance of superintendents, foremen and assistant foremen, since these officials have greatest initial influence on the management side in making labor relations co-operative or militant in nature, since they are closest to the men and actually handle the grievances that arise. The Commission, therefore, recommended more attention to the training of superintendents, foremen and assistant foremen in problems of management, especially in dealing with labor under a union agreement.

In this same connection the Commission stressed the importance of good operating management so that adequate service, including cars, supplies, etc., to the miners at work at the face will be maintained, and delays which limit the earnings of piece or tonnage workers may be avoided.

The fact that half-information on topics of mutual concern ranks high among the factors that tend to mar relations led the Commission to recommend the general policy of publicity of facts within the individual mines.

(3) More effective collective management of labor relations by operators. Outside of the non-union fields the miners are more effectively united by organization than are the operators. Differences of policy and differences of a political nature, of course, arise within the union, but after a given policy is agreed upon the union more often secures effective solidarity in carrying it through. There is no national organization of operators for the discussion and development of general labor policy covering relations with the union. The scale committee of the Central Competitive Field acts at times of negotiation in a way to produce results of national effect, but it represents only one section and is a temporary rather than a permanent organization. Even the local associations, of which there are many, usually do not cover the whole of a United Mine Worker District, so that unity of action even within the district is not secured by operators as it is by miners.

The result of the situation is that operators are apt to fail to attain a consistent policy either within the districts or nationally in their dealings with the union. In the districts where the agreements between the operators and the union are actually administered this lack of consistency of policy results in a disorganization of relations under the agreement. This disorganization comes about because certain operators adopt a "peace at any price" policy and, under pressure from the union, barter away rights specifically reserved to operators under the agreement, until all operators are practically compelled to make the same concession.

Or the opposite tendency prevails. And a "Hard-boiled" operator plays sharp tricks and breaks the agreement—a policy which destroys confidence, encourages retaliatory acts and brings a less responsible leadership to the top in the union. In other words, if extreme policies in either direction are not controlled, the position of those operators who honestly seek to maintain the agreement is made more difficult.

The absence of a continuing national organization of operators

devoted to a consideration of the common problems of labor relations, precludes a statesmanlike attack upon such fundamental problems of the whole industry as unemployment, wage differentials, etc.

Apparently, the Commission felt that the best hope of meeting some of the fundamental evils of the industry and of curbing abuse of power by the union was in more effective collective organization by operators, rather than in laws or labor boards, and hence called attention to the fact that the operators are not so effectively organized in the union districts as the miners and that both as a defensive and as a co-operative measure there should be effective district and national organization and a national labor policy among union operators. Such an organization should bring to the surface the large amount of sound and constructive thinking that is being done among operators concerning the labor problems in the union fields; it should strengthen and stimulate the work of the various labor commissioners. It should create the office of national labor commissioner, to function as do the labor commissioners in the districts, but on national problems. In this connection attention is called to the great importance, during the process of negotiating a new agreement, of having negotiators of the right type—men who know the union and the industry, who know when to be aggressive and when not to be, masters of sound strategy and wise tactics, and, finally, men whose straightforwardness the union trusts.

Many of the local operators' associations have striven for a unified, consistent policy in the administration of the agreement by the appointment of an official known as the labor commissioner, who represents the operators of the association in labor matters. The Commission indicated its belief that such an effort towards consistent labor policy was a step in the right direction in the following words:

> We find that one of the most constructive steps that has been taken collectively by the bituminous operators has been the almost universal establishment of the office of "Labor Commissioner." Only the highest grade men can adequately discharge the functions and get the full possibilities out of this office.

The Commission made three specific suggestions of important pieces of work that should be undertaken by operators and union collectively and which cannot be effectively undertaken so long as no national organization of union operators to discuss labor relations exists. These suggestions were made in these words:

(a) We recommend that the operators and the union undertake both separately and jointly the study of means of meeting the fundamental problem of unemployment through the stabilization of the industry, as a service to their own interests and as an evidence to the public of serious intention on their part to meet their own problems in a statesmanlike way under private administration.

(b) We recommend the establishment in each district and nationally of joint commissions of operators and miners, with the aid of competent men to make thorough studies of principal jobs and of the existing rate differentials. It is important to develop an adequate basis for the needed revision of the rate structure, at present marked by many inequalities between sections, between mines, and between jobs in the same mine.

(c) We recommend serious study by both sides, jointly and separately, of the problem of undue limitation of output and of the causes which lead to it.

(4) The administration of relations by the union. In the early conditions that prevailed in the mining camps of this country some external pressure approaching a monopoly character was necessary if the living conditions of the miner were to be brought to a decent standard. The United Mine Workers has been that external force. It has enormously improved the miner's lot. The union has won its struggle to become great and powerful. It is facing a critical transition period. "The challenge confronting it now is whether it can use great power in a responsible way to serve social ends."

All that has been said of the evil effects of bad management or of the constructive good which can be accomplished by good management on the operators' side can be applied with almost equal force to the union's management of its share in relations. When the growth of the union and the economic cycle swing the union into power, then its tactics and its practices become of vital importance. Over the past thirty years the greater importance of management tactics has been overwhelming; but a closer parity of

influence has been established in the last seven years, and the future may show as many periods of labor dominance as of dominance by the employer. The United Mine Workers in the future will be judged not merely on its ability to protect the interest of the miners alone, but also on its ability to see that self-interest lies also in safeguarding the interest of the public as well.

The law of diminishing returns must increasingly operate if dependence is only on a policy of sheer force and militancy. A powerful union with a large income, one which makes business agreements with employers, assumes responsibility to see that agreements are enforced by its members and the activities of irresponsible unions and union officials curbed, along with its authority to make agreements.

This applies especially to the union's program for the unionization of the non-union fields. Not merely must it avoid all destructive labor policies with such organization, but it must also recognize that the contest to organize the non-union fields will be won quite as much by the union's performance in the union fields as by its organizers' activities in the non-union.

Some such ideas as these seem to have been in the Commission's mind when it adopted the following recommendations:

(a) We believe that the union is facing a critical transition period. It has gone through and won the struggle to become powerful. "The challenge confronting it now is whether it can use great power in a responsible way to serve social ends."

(b) We particularly regret that the union has given so little serious consideration to the ways of meeting the fundamental problem of the coal industry,—the problem of irregularity of production and employment,—which concerns its members more deeply than any other problem observed, and on which they keenly desire that something be done. A definite effort to devise a joint system of unemployment compensation or insurance which shall offer considerable incentive towards steadiness of operation, as well as relief during payless days, will be of vital interest to the citizens of the industry.

(c) We believe that the union will need to depend more on *facts* and less on force if it is, in the future, to advance the interests of its members as successfully as it has in the past. We therefore suggest the importance within the union of continuous facilities for research which will collect and interpret facts and aid and enlighten union policy.

It furthermore plainly indicated that the distance between the higher officers and the local unions was great compared to other unions and that the resulting absence of close contact precluded the effective discharge of invaluable educational service by the union and maintenance of agreement-observing control over local unions. It, therefore, specifically recommended:

Much closer contact and greater educational service from the district and national officers of the union to the local officers and men.

Reference has also been made to the proposals of joint and separate studies of jobs, wage rates and differentials, unemployment and limitation of output. Concerning the check-off, the Commission reached the following conclusion:

We recognize the irritating effect of the check-off to the operator, especially in the collection of special fines and assessments. And we recognize its injurious effects upon the union in divorcing the problem of income from the winning of membership, and in the resulting lack of closeness of contact and of educational service and control by the higher officers to the lower officers, and to the rank and file members of the union. We believe that the unsettling effects of casting out this practice, however, might more than overbalance the gains. It may well be that the use of the check-off for the collection of fines and special assessments (except in the case of fines for violation of the agreement) should be discontinued. But we do not feel that the check-off is vital enough ever to justify a suspension of operations, whether the union is seeking to extend its use or the operators seeking to throw it out.

(5) The problem of the non-union fields. One of the most difficult problems of labor relations concerns the problem of the non-union fields, in many of which, especially in times of depression, rates of pay and other standards lower than those of the union fields prevail and where forcible measures are used both by the union which advocates unionization and by operators who oppose it.

The Commission took the position that the individual miners in the non-union fields should be allowed a free-will choice in determining whether they were to be unionized or not and expressed that policy in the following recommendations:

We recommend the recognition of the right by the union to encourage non-union workers to join the union by the example of service to its

members in the union field, by showing where the advances in the union field have helped the non-union workers and by *peaceful* and honest persuasion of every sort.

We recommend the recognition of the *similar* right of the non-union operator, by good works and honest persuasion *without force*, to maintain a non-union status.

We condemn violence, thuggery and gun work, violation of the law and disturbance of the peace, whether practiced by the union to enforce complete unionization, or by the operators to prevent it.

We recommend that such destructive labor policies as the use of spies, the use of deputy sheriffs as paid company guards, house leases which prevent free access and exit, and individual contracts which are not free-will contracts, be abolished.

Such recommendations cannot be enforced by any Federal power; their enforcement must depend on the state and local government.

In order still further to aid the miners in the non-union communities in making a choice based on facts, the Commission recommended:

Continuous compulsory collection and publicity of rates and rate changes in the non-union fields by the general Government.

Rates in the union fields are already public.

Appreciating that the absence of the union opens the way to certain abuses in management, the Commission recommended:

(a) That adequate checks to insure against capriciousness and unreasonableness be placed on the exercise of the right to discharge.

(b) The universal establishment in the non-union fields of a check-weighman selected and paid by the men as a means of insuring confidence in weights.

(c) That the form of wage payment known as "Subcontracting" be discontinued. It is held by most of the coal industry and by nearly all other industries to be out of date and inherently subject to abuse.

(d) That the leasing of convict labor to operators, such as is now the practice in Alabama and a few other nonunion areas, be condemned as demoralizing to the industry and degrading to the convict.

(e) That the discounting "scrip" be made illegal.

(6) Joint adjustment machinery, including the making of agreements. Most of the agreements in the various districts contain provision that disputes arising during the life of an agreement shall be settled, if possible, through the joint conciliation board of

the district, or, failing that, by some arbitrator, such as an umpire. Some districts do not contain such machinery for peaceful adjustment of disputes and delays in settlement and illegal local strikes tend to be encouraged. In consequence of these facts, the Commission recommended:

(a) A continuing umpire in each district as indispensable to the growth of good relations, since such an agency tends toward the establishment of orderly processes of law in the industry, facilitates the necessary bargaining that goes on from day to day, is an educational force for both operators and union and is a foundation for progress upon which the industry can build with confidence.

It furthermore recommended:

(b) That each agreement in the union fields contain provision that disputed cases of discharge shall be settled promptly through conciliation or arbitration.

(One wonders why this should be limited to *discharge* cases arising under the agreement.)

As a part of the joint machinery of relations may be considered the process of making the new agreement. The union first negotiates its agreement with the Central Competitive Field (Illinois, Indiana, Ohio and western Pennsylvania) and will negotiate with no other fields until this agreement is made. The Central Competitive Field agreement having been made, the other district agreements follow it in essential matters more or less automatically. Many criticisms of this system exist; of these, the criticism that it does not allow adequate flexibility to meet necessary local conditions as to competition, or that in cases of a national strike a local union and the local operators' association are restrained from agreeing when they are willing and ready to agree; and the criticism by outlying operators that their agreement is substantially made for them in conferences in which they are unrepresented are the most important. Without discussing these reasons the policy of the Commission may be quoted:

We recognize that the establishment of a policy of complete district autonomy in the negotiation of new agreements, as advocated by some operators, would result in great turmoil and a renewal of the fierce

competition between districts that must inevitably lower standards. We suggest, however, that many operators in the outlying fields have a real grievance when they say that essential elements of their agreements are made for them in conferences in which they are not represented. We suggest that the two parties should work out a system of national negotiation with district agreements, which will avoid standard-cutting wars between districts and secure adequate flexibility to meet necessary district conditions.

(7) The national strike and the Government's relation to labor relations. This subject is discussed in Chapter XI, "Labor Relations in Anthracite Mining."

CHAPTER VII

Better Service and Less Waste

From the wide range of information which is presented in the foregoing chapters, the Commission found

> no reason to believe that a dependable supply of coal at a reasonable price is inconsistent with reasonable conditions of life and citizenship for the miners, or with a reasonable return on judicious investments.

Better service is implied in this finding, and an investigation of the processes of mining and distribution from the point of view of the elimination of waste was a necessary part of the report. The Commission examined underground management methods; waste of coal in the process of mining; fuel economy; contract purchasing; preparation and sizing of coal; coal storage, and various topics which bear upon the subject of relief from irregular operation and overdevelopment.

A widely-known industrial engineer, Sanford E. Thompson, was employed to visit a number of well-managed mines in the company of the Commission's mining engineers, and to appraise mine management underground from the point of view of sound industrial practice. The value of his report depends in part on the fact that it is not the work of a mine manager or a mining engineer, but of an industrial engineer of acknowledged authority in factory management.

1. Underground Management

A vast field is beginning to open in the development of underground machinery and mechanical equipment. This will reduce by at least one-third the cost of coal on cars at the mouth of the mine. Of equal importance to the industry will be the application to coal mining of the general principles of production control and standardization of production which are bringing large results in other industries.

The vital relation of these things to harmonious labor relations lies in the elimination of causes of friction and the substitution of facts for opinions.

The old proverb, "Out of sight, out of mind," explains, perhaps, why underground management of coal mines is less advanced than management of production in most other industries. Mining equipment above ground, such as the power plants, the tipple and the bath houses, has reached a high plane. Underground, however, while electric motors have vastly improved the mechanics of transportation, and undercutting machines have reduced hand labor, there have been few radical changes in coal mining in the last fifty years.

The general scheme of handling work underground is similar in nearly all mines, although great variation exists in the details of the methods, because of the variation in physical conditions; but it was found possible, through careful examination of a comparatively few mines selected in representative districts and a broad general survey of the field, to present specific conclusions.

Summary of management principles. The features of underground management of fundamental importance to the future of bituminous coal mining are greater safety and reduction in cost through machine loading instead of hand loading, more systematic control of underground operations, and improvement of the handling of the work of the individual through analysis and standardization so as to give each man a square deal.

Mining by machinery. Some 70 per cent of the cost of coal at the mine is labor cost, and more than one-half of this labor cost is incurred in cutting and loading coal into mine cars. In only one-half of the bituminous coal mines of the country the introduction of machine loading, with the incidental developments accompanying its installation, would produce an actual net saving of about $200,000,000 per year. The loading machine is still new, however, and time must elapse before it is generally introduced.

Certain kinds of electrical machinery and equipment have already come into general use. Undercutting of coal by hand has been largely eliminated by cutting machines which slice out a deep horizontal channel so as to aid in freeing the coal when it is

shot. Electric motor engines with overhead trolleys are used universally for haulage of trips on main lines and cross entries.

The principal partings and often the working places themselves are lighted by electric lamps. Ventilation and drainage have been greatly perfected by electric fans and pumps.

Many types of loading machines have been experimented with. In the West, with the softer coal and thick seams, electric power shovels of the steam shovel type have been adopted and continuous scoops of the bucket conveyor type have been used. But for the ordinary mine east of the Mississippi, where relatively hard coal occurs in seams ranging from 4 feet to 10 feet thick, a loader of the type described below, which is just beginning to come into use, is proving most effective.

A loading machine and its work. A sketch of the general type of machine loader now being introduced is shown in Chart 18.

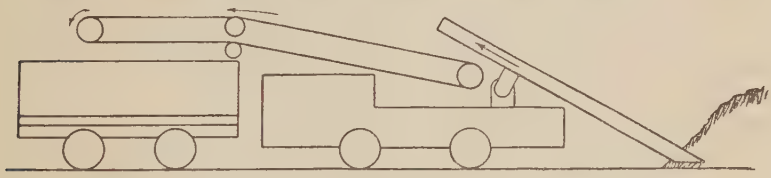


CHART 18. TYPICAL OUTLINE SKETCH OF A MACHINE LOADER

Records of a day's work on large loaders are based on actual confidential records in mines where machinery has replaced hand labor, supplemented by stop-watch time studies. Studies in one mine show that the large loader fills a four-ton car in an average time of 3.2 minutes, with a minimum of less than 2 minutes. In another mine a number of cars were loaded in a little over a minute each. An 8-hour day's tonnage for the machine was over 350 tons (of 2,000 lbs.), where only 56 per cent of the time was used for actual loading. The balance of the time was used in moving the machine, changing mine cars and incidental delays. A conservative estimate for a regular 8-hour day's loading by a single large loader with a properly developed transportation system is 500 tons, and 150 tons for a small loader.

A direct comparison of hand and machine loading between a

mine equipped with loading machinery and the same mine six months earlier, with all hand loading, shows that in the hand loading mine for an output of 730 tons per day 118 men are required underground, against 73 men for 814 tons in the machine loading mine. The average tonnage per man underground in the hand loading mine is 6.2 tons, which is larger than the average in most bituminous mines, as compared with 11.2 tons in the machine loading mine.

A graphical comparison between machine loading and hand loading is shown in Chart 19.

The hand loading curve represents the work of the loader at the face and does not include (as in the 6.2 tons average above) the labor of company men who lay track, handle cars, maintain equipment, etc. Further details of these comparisons are given in the Commission's complete report.

In the light of this comparison one may picture the difference between a hand and machine loading mine. In the hand loading mine we see, in say seven-foot coal, 30 to 50 loaders in as many rooms, scattered over twenty-five acres, advancing say 300 feet in four months. In the same mine, using a large loader, the area of operation is three acres for a 400-ton daily output—an area less than one-eighth that required for hand loading. With machine loading the foreman is with his men all the time, in immediate touch with timbering, shooting, laying track, cables, roof conditions and, in fact, all the mining activities underground except some main line haulage.

The gains from machine loading may thus be summarized. Loading is performed at a fraction of the time and cost of hand loading; undercutting can be performed more systematically and efficiently; drilling is done by electric drills; hauling is simplified and trips can be scheduled more definitely and haulage costs reduced; timber is reduced in amount; falls of roof are less frequent because of rapid progress and, in long wall work, less working room is required; concentration of workings produces large tonnage in small areas; inspection and supervision is more effective because of the smaller active area; cost of track equipment and maintenance is reduced by fewer rooms, or if long wall, no

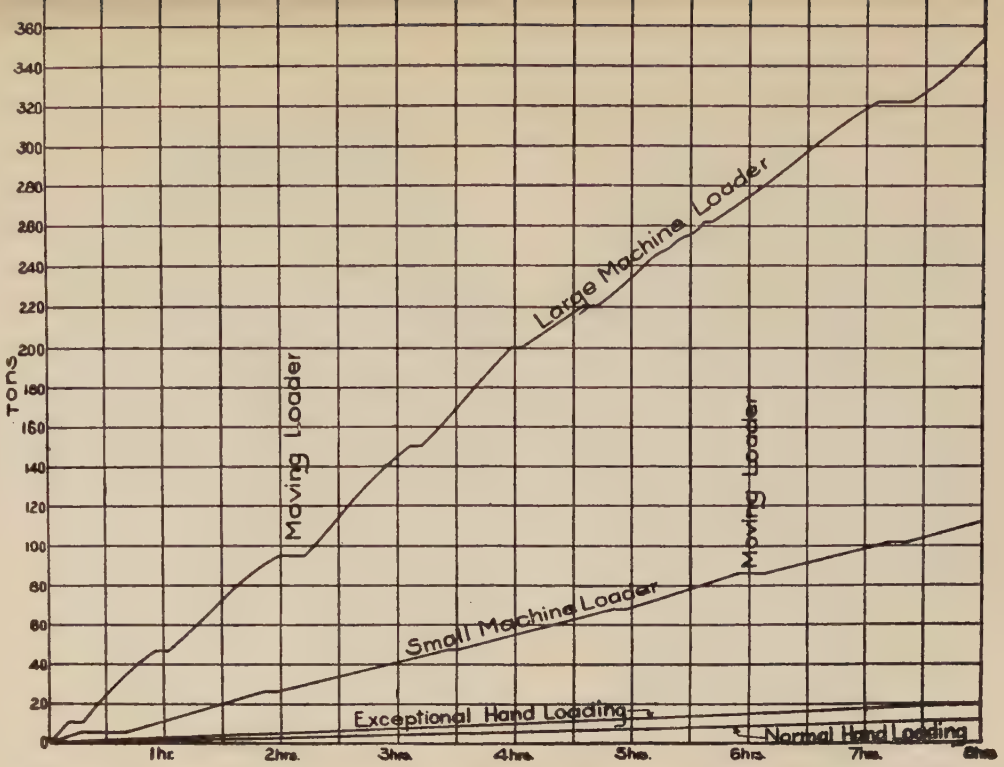


CHART 19. ACTUAL OPERATION OF A LARGE AND SMALL MACHINE LOADER FILLING MINE CARS DURING 8 HOURS

Horizontal sections of curves show times moving machine between working places. Sloping lines show gross rate of loading including waiting for cars.

rooms at all; cost of drainage is reduced by the smaller active area; cost of ventilation is reduced for similar reasons; cost of plant construction per ton and maintenance is reduced through larger production per man; waste of coal is lessened by larger recovery; safety is increased through concentration of the area worked and closer supervision.

Management of underground operations. Instead of leaving the distribution of miners' cars to the motorman or assistant foreman instead of a hit-or-miss supervision of cutting machines and of company men, more definite planning and control of transportation and of all other underground operations are needed. These must include not merely a morning schedule, such as is now thought out in some mines, but a positive control continued throughout the day, to include not only the directing of the mine cars to the miner and of the locomotive trips, but also the corelation of the operation of cutting machines and all company work with the loading. Increase in output at the mines will naturally follow such developments, as well as a saving in overhead and gradual reduction in cost with increased contentment of the workers through elimination of lost time.

At a number of mines one finds systematic plans of issuing stores, control of stores with running inventories, cost accounting systems and payroll records, some of them equal to or better than those in other industries. On the other hand, planning the work of the men and the cutting machines and the trips of the mine cars is generally crude and unsatisfactory.

Haulage delays and remedy. A large proportion of the unrest and irritation of the miner is directly chargeable to insufficiently planned haulage. Underground haulage is the circulation system of the mine; every throb is felt throughout the whole system of underground tunnels. Haulage alone touches every remote live part of the mine at intervals through the working day. Haulage is naturally the pace setter, the stabilizer of underground operations, yet in the majority of mines it is left to the discretion of the motorman or mule-driver. Only two mines of those visited made even an attempt at planned control.

Studies in various mines, all of them far above the average in

A Mechanical Loader

management, show the following commonplace occurrences: Main haulage trips in the same mine varying from 8 to 45 minutes apart; seven haulage motors, together with fourteen drivers and mules, idle, awaiting empties forty-five minutes in the hour and one-half of the day; allotted travelling time of mules and motors based on guess instead of timed observation and analysis; miners' loading time fairly uniform, but waiting time of wide variation; one man working alone waiting for cars an aggregate of two hours during the day; two men (in another mine) working in the same room each waiting for empties two hours and forty minutes of the day; the number of miners attended by one mule or one motor varying greatly in the same mine, with no exact analysis of conditions to determine proper balance; number of loads and empties on partings unplanned and seldom twice alike; lost time for haulage in morning hours and a jam at the close of the day.

All of these difficulties can be greatly minimized with well-planned and well-executed scheduling and dispatching. The operator depends upon the engineer only in so far as his work relates to design and layout. Modern management considers the planning of the work and the determining and maintenance of standards as an engineering function, separating the detail of these duties from the strictly executive functions.

The work of the individual miner. Analysis of the operations and determination of the best methods and times for accomplishment will result in larger performance of company men, will provide a basis for more thorough co-ordination of the work, reduction of delays, systematic handling of dead work, development of standards of production for company men as well as loaders, and, eventually, balanced earnings, not from the standpoint of uniform wages and uniform piece rates as at present, but designed to give each man a square deal in rewarding individual performance.

The skilled miner does not confine his efforts exclusively to shoveling coal. In addition to being a trained specialist in shoveling, he has, between loading of consecutive cars, a change of work, such as drilling and loading, picking, setting props and gobbing.

The co-operation given to the miner by the management in most mines, and this applies to company men on day work as well as to

tonnage men, is inferior to that of other industries. The irritation due to this failure to supply necessary transportation for the product of his day's work; to co-ordinate the duties of other workmen upon whom he depends; to furnish supplies as needed; to assist him by instructions in how to perform the work; and, often of even greater importance, to analyze conditions and methods so

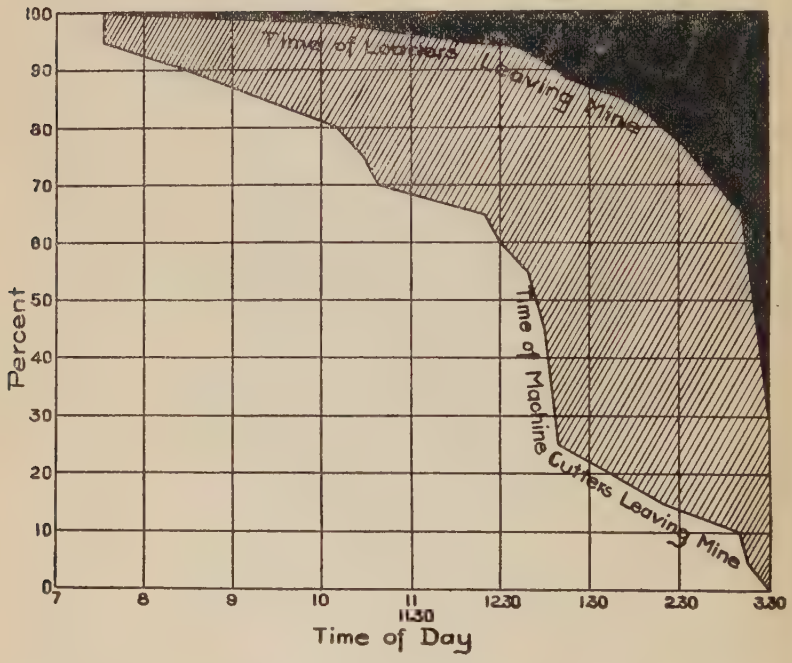


Chart 20. Per Cent of Men Remaining in a Mine of Those Who Entered on This Day

as to make his work as easy as possible—the irritation caused by these things is one of the major causes of dissatisfaction. When by failure to secure a needed mine car a miner may readily lose from one-fifth to one-third of the earnings he desires to make, even if this failure occurs only occasionally the bad effect upon the man is evident. When he loses because of inferior supervision his aggravation is equally great.

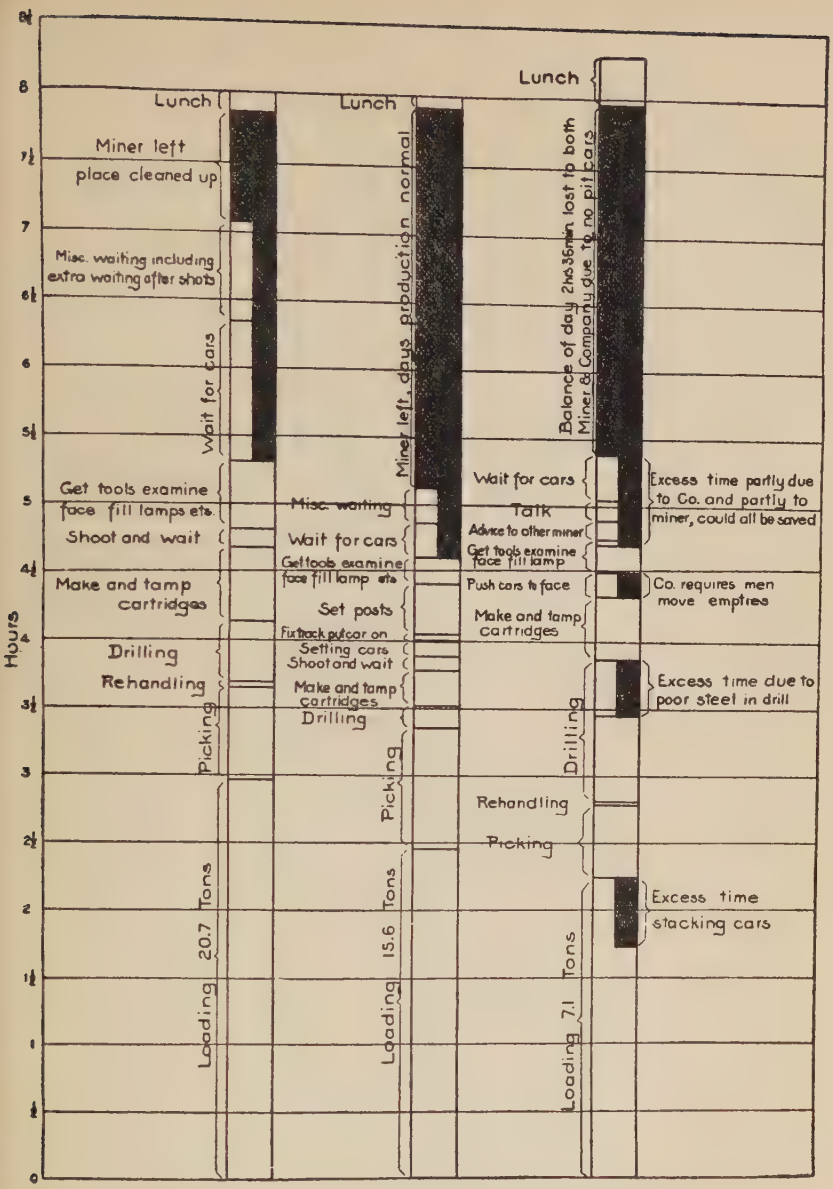


CHART 21. A DAY'S WORK OF THREE MINERS IN THREE MINES

Miner earned... $11.70	Miner earned... $10.20	Miner earned.... $7.45
Possible earnings. 17.03	Possible earnings. 17.69	Possible earnings. 12.50
Actual working time 5 hours 29 minutes, per hour..... 2.13	Actual working time 4 hours 37 minutes, per hour.....2.21	Actual working time 4 hours 46 minutes, per hour.....1.56

Working time of the miner. Miners leave the mine all through the day, a group sometimes comes out immediately on going in because their "place" is not ready for them. From eleven in the morning until closing time there is an increasing outflow for various reasons.

A record of the actual time of all the miners and the cutting machine working in one mine is shown in Chart 20.

TABLE 58

Number of men quitting early for specified reasons

REASONS	MINE TS	MINE RZ	MINE RM	MINE GH
No cutting ready	4(M)	29(M)	—	10(M)
Bad top	1	—	—	—
Cleaned up	10	80	56	22
Got turn* or plenty	6	63+	26	20
Sick	2	3	2	—
Changing place	2	—	—	—
Wreck	1	2	—	—
Machine broke	1	4(M)	—	—
Track not laid	1	2	—	—
Hurt	—	3	—	—
Shots not fired	—	1	—	—
Fall in place	—	4	—	—
Miscellaneous	—	2	3	2
Quit	—	—	2	—
Reason refused	—	—	1	2
Catch train	—	—	4	—
Bad lamp	—	—	1	—
Water in place	—	—	3	3

M = machine cutters.

* Filled allotment of cars.

This is fairly representative of a mine running on nearly full time production or in thick seams which permit large earnings. When the mines run only a few days per week the miners are apt to earn all they can in a day. These facts indicate that the existing piece rates are based on the knowledge that the mines operate only a part of the year and only a part of each month. When the mine is operating steadily the miner can earn a satisfactory wage before noon.

The reasons given by men in several mines for quitting early are illustrated in table No. 58. Note on the one hand that 65 men left mine RZ on the day observed because they had earned all the money they wanted, and on the other hand 80 men left early because they had no more coal out ready to load.

A day's work of the miner. Although lack of time prevented analysis which would give data of statistical value, the detail records of a day's work shown in Chart 21, of three loaders in three different mines' located in different fields, is of interest from a management standpoint.

These few studies, of course, are insufficient to show average conditions, but they indicate the types of delays and changes in mines.

Each division in the vertical column represents not sequence of operations, but the sum of all of the times on the same operation throughout the day; that is, for example, the lowest section is an accumulation of all of the time shoveling, while the sections designated as "waiting" are the sum of all the short delays occurring throughout the day.

The data are made up by complete stop-watch observations in each working place. The two left-hand columns are for a complete cycle from clean-up to clean-up, where the two loaders were working together (with two rooms available) in each mine. The right-hand column represents pick mining, that is, no machine cutting was employed.

All of these things show clearly the great need of standardization of the work of the miner. Illustrations might be given also of similar need in the work of the cutting machine.

Illustrations of inequitable wage rates. The pay question is complicated by the rock which has to be taken out with the coal. In some districts the rock or slate handled by the miner is paid for in the rate for loading coal so long as the thickness of the slate is not more than 12 inches. For taking down thicker seams the miner is paid by the inch of thickness. Consequently, when there is no slate the miner receives an excessive rate and when the slate is thick he is penalized. From detail time studies it was found in one case that the miner handling a moderately thick seam of

slate was receiving only half his average hourly earnings. In other cases, on the other hand, with little or no slate, his earnings would be excessive.

Standardization of production. The only reasonable solution of this problem is in the establishment of standards through which

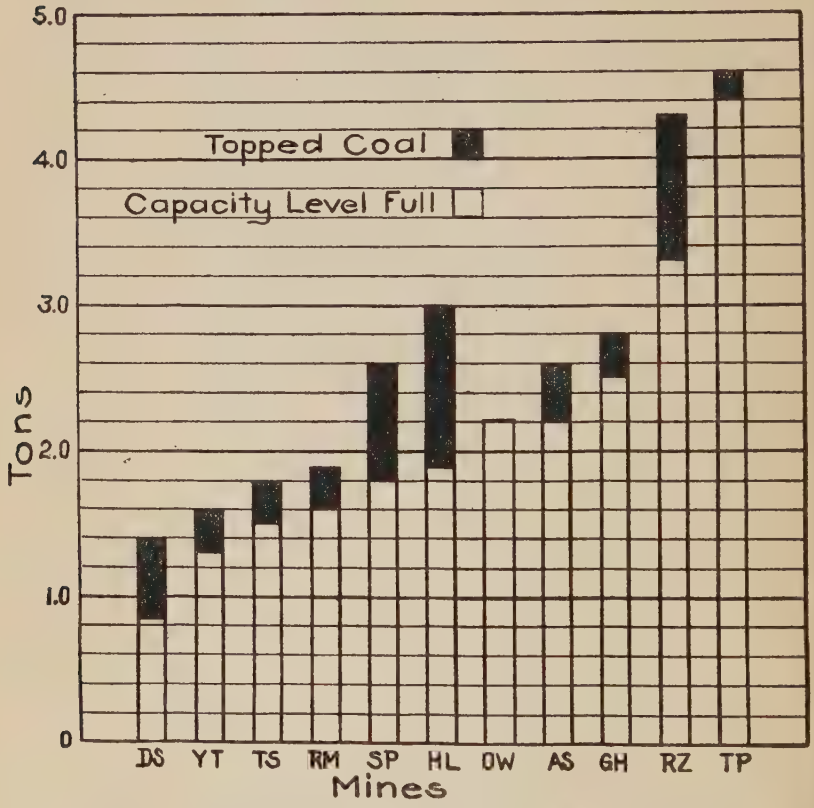


Chart 22. Average Mine Car Loads of Coal in Various Mines

equitable piece rates can be worked out, covering all parts of a miner's work. In a few mines an approach has been made to this. In at least one metal mine, where the conditions are more variable than in coal mining, all operations have been thoroughly standardized.

Standardization of equipment. Standardization of mine cars, motors, weight and gauge of track, electrical equipment, etc., with

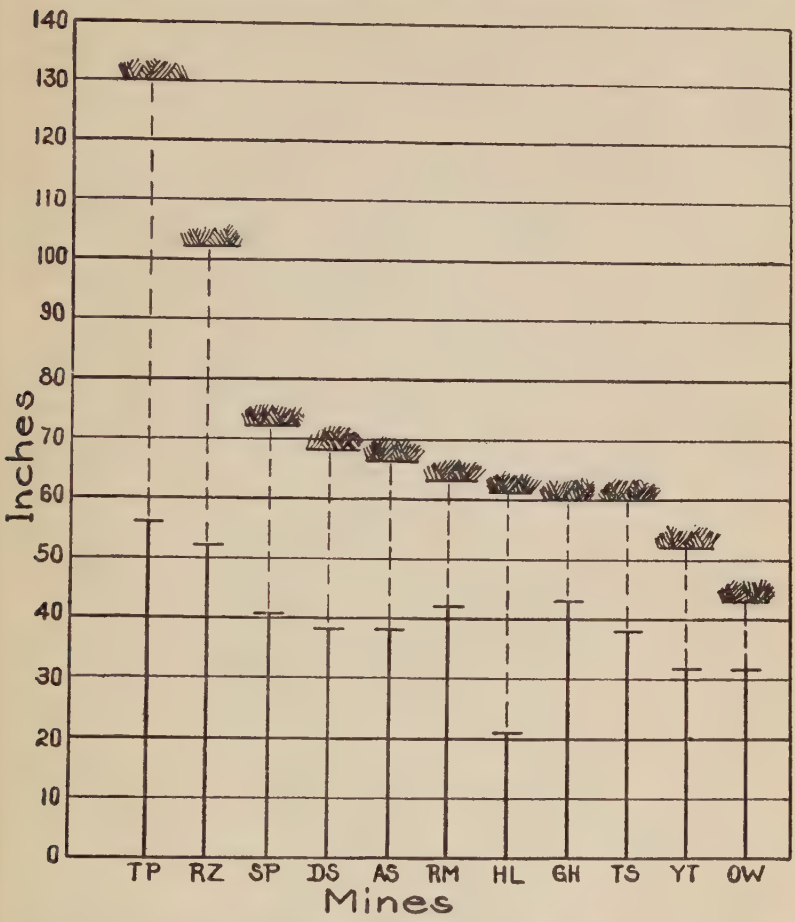


Chart 23. Mine Car Heights Above Rail and Roof Clearance in Various Mines

determination of the best for the individual mine, is being gradually, but very slowly developed.

Illustrations of typical variations in capacity and weight of mine cars are shown in Charts 22 and 23.

Similar variations occur in other equipment. The American Mining Congress and many individual mines are working toward greater standardization. The opportunity is large and fundamental, as such details affect vitally both economy in operation and the severity of the labor.

2. WASTE OF COAL, FUEL ECONOMY, CONTRACT PURCHASING AND STORAGE

The engineering staff of the Commission examined waste of coal in mining, waste of transportation, waste in burning coal and the great waste of capital and man-power due to intermittent operation of the mines, in order to suggest improvements in the service which the industry should render.

Waste of coal. Coal left in the ground that might have been recovered as mining progressed, is waste. Always some coal must necessarily be left behind; the difficulties and dangers of mining preclude a complete recovery of the resource originally in the ground. In some fields avoidable losses have been practically eliminated and the unavoidable losses reduced to 10 per cent, so that around 90 per cent of the original deposit is mined. There are mines where but a third of the coal is recovered and two-thirds lost for all time, and there are whole fields, as Illinois and Indiana, where the recovery is only slightly more than half the total and the avoidable loss is 30 per cent of the original coal content.

Where coal is left unmined to support the ground beneath buildings, highways, railroads and streams, and as dams to protect new workings from danger of flooding from old workings, the loss is unavoidable. Thus, according to the engineers of the Bureau of Mines, who studied this subject for the Commission, there were left in the mines and lost to future recovery 196,000,000 tons of soft coal in the production of 368,000,000 tons in the eastern States in 1921. Of this loss of natural resource, 109,000,000 tons should have been recovered by proper methods of mining and with due regard for safety.

Coupled with careless methods of mining is irregularity of operation as a direct cause of actual waste of coal. Temporary

cessation of work, caused by strikes of labor, by market conditions, or from whatever cause, results in general deterioration of timbers and gradual collapse of workings, many of which are not reopened. The greatest waste is in the coal mines underlying the flat areas in the Middle West, where to protect the valuable agricultural surface, half the coal is left as "pillars" for support of the roof. This is generally held by engineers and operators in these coal fields to be cheaper than to take out all the coal and drop the surface evenly, as is possible in many areas.

It is a general observation that the coal in the ground that is the most valuable, because of quality and accessibility to market, is mined the cleanest. For instance, the deposits of smokeless coal of southern West Virginia are of limited extent and here the operators work their mines so as to leave as little as 10 per cent behind. The Pittsburgh seam in western Pennsylvania is extremely valuable because of high quality and nearness to the iron and steel producing centers. Coal land here has been sold as high as $2,000 per acre. With mining conditions more severe than in the smokeless fields of West Virginia, recovery of some companies reaches 85 per cent.

Waste in mining is then a problem in economics. Where it pays to take all or nearly all the coal, the recovery in mining is high and wastes small, but where the reserves are greater and possibly the mining profits smaller, more coal is wasted.

Storage. Storage of coal by consumers is the all-important balance wheel between fluctuating consumption and variable production. It is the consumers' insurance against temporary failures of transportation, such as those caused by storms. It is the only protection yet devised for the consumer against protracted general stoppages of coal mining or of railroad deliveries. From having a few days' coal supply on hand it has been but a step forward for the consumers to accumulate a week's or a month's surplus. The more distant from the coal field the larger the surplus of coal which it has become the natural thing for the consumer to pile up.

In 1918 some 63,000,000 tons of soft coal were in consumers' storage piles on armistice day—an unprecedented quantity. In 1920 the lack of storage, for which the consumers were in part

responsible for having so generously burned up their surplus coal in 1919, cost the buyers of soft coal millions of dollars when they precipitately sought to refill their bins during the summer of that year.

In anticipation of the general strike of soft coal miners on April 1, 1922, the country bought and stored more than 60,000,000 tons of soft coal in the fall and winter of 1921-22. This huge stock pile, largely depleted during the 5-months' strike of 1922, was rebuilt in the summer and fall of 1923, and on January 1, 1924, stocks were again past the sixty million ton mark.

These facts about storage by industries, public utilities and railroads, the large users of bituminous coal, are recited to show that storage has been and can at any time be undertaken on a large scale in this country. The consumers of anthracite, the householders, years ago learned the distinct advantage of putting all or a large part of the winter requirements into their cellars during the warm months. The fact of summer buying of anthracite, assisted by the summer discounts in price, was a large factor in regularizing the anthracite industry. This should be continued and perhaps extended to the bituminous coal industry.

Regular, systematic, large-scale storage of bituminous coal by consumers during the seasons of low consumption is the public's largest opportunity and responsibility in solving the coal problem. Another direction in which the buyer can and should help not only himself but the coal business, is in proper selection of his fuel.

The proper methods of soft coal storage, the depths of piles, protection against fires and spontaneous combustion, reclamation, loss of heating value and degradation are technical questions that have been studied intensively by the Bureau of Mines and State and private institutions, as the Illinois Engineering Experimental Station, the Carnegie Institute of Technology and the International Railway Fuel Association. The results of their investigations are published and available to all. The conclusions of those who have studied the technical question of soft coal storage are that there is a proper safe way for the storage of any and all kinds of soft coal and that improper methods will render the best coal liable to spontaneous combustion. For most coals the losses in

heating value and degradation are comparatively small. In general the larger railroads and the public utilities have a definite policy on storage. It is, briefly, that small reserves must always be maintained and that unusual reserves are only to be accumulated against impending stoppages in supply. In areas as remote from the mines as New England and the Northwest what might elsewhere be considered a large reserve becomes inadequate insurance against interrupted supply, and the reserves in these distant markets are nearly always the largest in the country, both in tons and in terms of days' supply.

The cost of storage is an indefinite figure. Considering interest and maintenance of the extra mechanical equipment, interest on coal, cost, including freight, and deterioration and shrinkage of coal, the costs range from 50 cents to 75 cents for large storages, 50,000 tons or more, to $1.00 to $1.50 per ton for small storages of a few hundred to a thousand tons. These costs are on the quantity of coal actually stored. Spread over the total tonnage used in a year, and figured as cost per ton for all coal used, the figure is much less. This is the fair basis for calculating the cost of storage.

The consumer who has learned to store coal only as a necessary measure of self-protection should undertake it as regular business practice. Every year of normal business and industrial conditions, in the six months from April to September the price of bituminous coal is lower than in the fall and winter. In these months the consumption of coal is lowest. It is the part of good business for the buyer to take in during the summer months more coal than he burns, to put into storage and use the reserve thus accumulated during the winter months when requirements are above the average. The best practice, not only for the buyer but for the seller, is to have the year's coal produced and shipped in 12 equal monthly installments. The buyers who wait until fall or winter to place their orders may expect to pay a higher price.

Fuel economy. The Commission made no special investigation of fuel economy, but in stressing the importance of storage it pointed out that the consumer logically cannot complain of wasteful production of coal if his own consumption of coal is even more

wasteful; nor can he justly complain of high prices for coal if he throws away a large part of the heat units in the coal he buys. In 1922 the electric power stations of the country generated from coal 25 per cent more kilowatt hours than in 1919, but in doing so they burned nearly a million tons less coal—a case of fuel economy on a national scale. The super-power project which plans the installation of only the largest power plants would effect even greater savings in the consumption of coal as well as in the transmission of electricity.

These great possibilities in the more efficient and wider use of coal emphasizes the importance of every measure for conserving this invaluable resource.

Purchase of coal on contracts. Purchases of this character have a strong tendency for regularity of mine operation and to steady the market. It is to the advantage of both coal producer and coal consumer that their relations be more or less permanent. Every time a producer abandons a market that has been educated to his product, or a large consumer changes his source of supply there is introduced an incentive for increased mine development. This shifting about in the search for more profitable outlets or for cheaper and better coal must always continue in a competitive business such as the bituminous coal industry, but the degree to which it has taken place in the past six years has greatly disturbed the trade.

This unusual shifting about by producers for markets and by consumers for tonnage has been the result of complications in the production and distribution of soft coal introduced by the war and by the nation-wide strikes in the organized coal fields. A vast majority of the coal producers make contracts for the sale of their product. From 65 to 75 per cent of bituminous coal is sold on contracts covering deliveries of six months or more.

Producers contract to sell their coal either directly with consumers or with an intermediary, a selling agent or wholesaler, who in turn resells to the consumer in wholesale quantities either by contract or in the open market. In 1920 sales agencies took 42 per cent of the tonnage shipped under contract by producers; in 1921, 45 per cent. This should not be construed as a measure of

the quantity of coal handled by jobbers. It is, instead, a measure of the extent to which producers, notably small operators, contract for the disposal of their product through separately incorporated or independent selling agencies. The merchandising of coal is a separate function from its production. Between 40 and 45 per cent of the commercial tonnage that is sold on contract by the producer is handled by selling departments or sales agents distinct from the operating company. The remainder, or between 55 and 60 per cent, is contracted for sale by selling departments of the producing companies.

An investigation by the Commission of how well coal contracts are lived up to by producers, as well as by purchasers, revealed that in 1920, when the buyer wanted more coal than the producer could ship, contract customers received from 73 per cent to 92 per cent of the tonnage on contract, and in 1921, when the buyer was deluged with coal and the producer was more than willing to fulfill his contracts, the consumers took from 64 per cent to 92 per cent of what they had under contract. The average performance in contracts with all classes of consumers was 84 per cent in 1920 and 83 per cent in 1921, indicating that buyer and seller are about equally virtuous in the observance of the coal contract. However, figures showing a 60 to 85 per cent performance on definite tonnage contracts suggest either external interference with performance, the recurrence of which, if possible, should be guarded against, or loose practices within the industry that should be corrected if the stabilization that might reasonably be expected from contract sales is to be attained.

Competition for business is normally so keen that it is a rare occurrence for a shipper to sue a buyer for damages for breach of contract, even when the shipper feels reasonably sure that there has been a deliberate avoidance by the party of the second part. His explanation of his refusal to stand upon his legal rights is that such action would make his customer his enemy and deprive him of all hope of future business relations with such a buyer. In many cases producers have reduced the contract price during the term of the agreement, but in only a few cases have buyers consented to an advance not contemplated by the contract.

If contracts, and particularly definite tonnage contracts, are to have the stabilizing influence in the industry that might reasonably be expected, it is patent that there must be a decided change in mental attitude upon the part of both consignor and consignee. Every definite tonnage contract should be recognized by both parties to an agreement as a fixed obligation upon the part of the seller to ship and the buyer to accept the tonnages called for in the contract, except when prevented by causes beyond the control of the parties.

Contract tonnage in every and all cases should have precedence over spot coal deliveries. All spot coal orders should be taken subject to contract priority. Moreover, the purchaser should be given a yardstick by which to measure contract performance. He should know the estimated annual output of the shipper and the actual monthly shipments. He should also be kept informed as to the total contract obligations of the shipper, and, in the event that the actual performance was less than the contract commitments, then adjustment should be made upon a percentage basis.

3. RELIEF FROM IRREGULAR OPERATION AND OVERDEVELOPMENT

Causes of shortages. Widespread strikes and lack of railroad transportation to carry the peak load in times of extreme demand are the two factors that alone are responsible for the serious shortages of bituminous coal in this country which have occurred since 1915.

It is estimated that it would cost the railroads two billion dollars to build their facilities up to the point where they could carry the peak loads of coal. This would represent an average carrying charge alone, with interest at 6 per cent, of 40 cents a ton on commercial shipments of bituminous coal. Such a solution of the problems of the coal industry could be considered only if none other were possible.

The alternative is better use of the transportation facilities currently available. This means simply the more uniform movement of coal throughout the year. Since the fall of 1922 the railroads have furnished transportation for a production of between 10,000,000 tons and 11,000,000 tons of bituminous coal per week;

that is, from 500,000,000 to 550,000,000 tons per year, which apparently at this time is sufficient for the country's requirements and exports. This has not been accomplished without special effort. The railroads must be expected to expand their coal-carrying facilities in step with the expected increase in the nation's coal requirements, but they, in turn, should not be permitted to dissipate their efforts in needlessly long hauls of coal.

Operating to hinder the uniform purchase and movement of bituminous coal are the seasonal character of consumption and the fluctuations in consumption attending changes in industrial conditions. The variation in use of household coal represents the extreme in seasonal requirements; the industrial expansion in 1915 is an example of rapidly expanding market, due to improvement in business. A further factor, not so important as it was before 1917, is the national habit of buying soft coal as needed, instead of storage against future needs. Large scale strikes, either at mines or in railroads, of course, are positive bars to production.

The consumption of coal is an independent factor, not to be changed, except as it is prevented through sheer inability to obtain supplies, by any economic or legislative proposals. It is obviously impracticable to legislate in the direction of forcing the uniform purchase and transportation of coal. The only remedy lies in furnishing an economic incentive to off-season purchase and the consequent storage at the point of consumption of bituminous coal, *at the proper seasons.* As has been stated, the alternative is overdevelopment of the railroads at an initial cost of $2,000,000,000, and an increase in coal freight rates in which the item of 40 cents a ton to meet added interest charges would be possibly the smaller part.

Among the more important of these factors contributing to overdevelopment prior to 1916, even beyond peak demand, were periodic regular strikes in the organized fields. The most important and regular were those in the Central Competitive Field, beginning April 1 every second year. These strikes came with such regularity that their effect was anticipated. Consumers, particularly the railroads, bought heavily in advance and stored coal

to tide them over the strike. This meant a season of very active demand, which encouraged development of new mines. In years when these strikes were of more than usual severity the non-union fields were called in to meet added demand for coal; thus their overdevelopment was promoted.

In this manner the irregularity of production caused by seasonal demand, sectional stoppages of production, and local transportation shortages brought on overdevelopment. To these causes are to be added the persistent seeking by railroads and by coal operators in the past 30 years for markets for the newly-developing fields south of the Ohio River. In the early 90's the Pittsburgh Field supplied 35 per cent of the total production of the Appalachian Fields, shipping to the Central West and the Northwest; and the West Virginia Fields shipped 15 per cent. Competition offered by the Southern Fields has cut Pittsburgh to 25 per cent in the past five years and raised West Virginia to 32 per cent of the total.

The consequences of overdevelopment can be avoided only by removing, so far as economically possible, the causes that have produced it. Overdevelopment will then diminish to the economic minimum.

The causes and avoidance of strikes have been discussed elsewhere in this volume. In the following pages are considered those causes related to production, transportation and distribution. The more important conclusions reached are briefly these: The system under which coal cars are distributed to coal mines in times of transportation shortage should be changed to give first consideration to the commercial ability of the producer to sell coal rather than to ability to produce and load it into railroad cars; and given substantial similarity in the grade and quality of coals available to a particular market, there is obvious economy in supplying that market with the coal nearest to it.

The first will furnish the economic incentive for regular off-season purchase and storage of bituminous coal by the consumer and by thus increasing the length of the average working year for the mine and miner, reduce costs of production and prices to the consumer. The second, by minimizing unnecessary and pre-

mature development, will operate in the same direction and at the same time accomplish savings in the cost of transportation.

The immediate cause of high and exorbitant prices of soft coal is a demand from buyers far in excess of the supply. There is no evidence of any combination or monopoly among producers and shippers of bituminous coal, now or at any time, to control production or influence prices. In fact, the mines are so numerous, the control so diversified and the competition so keen that such a combination even to influence the price is inherently impossible.

The initiation of active buying of coal, as of any other commodity, tends to elevate prices. The sharp activity that characterized the coal market in the fall of 1916 and throughout 1917 was the immediate result of consumers' anxiety for coal. Stocks were low, business was booming and more coal was required to manufacture and transport the products of industry. Without coal nothing could be made to fill the orders and the industrial consumer began to bid for coal. He set the price.

The price went up under these circumstances because the consumer could not get coal as fast as he wanted it. This inability was not due to lack of soft coal in the ground, of mines, or of miners, but to lack of transportation.

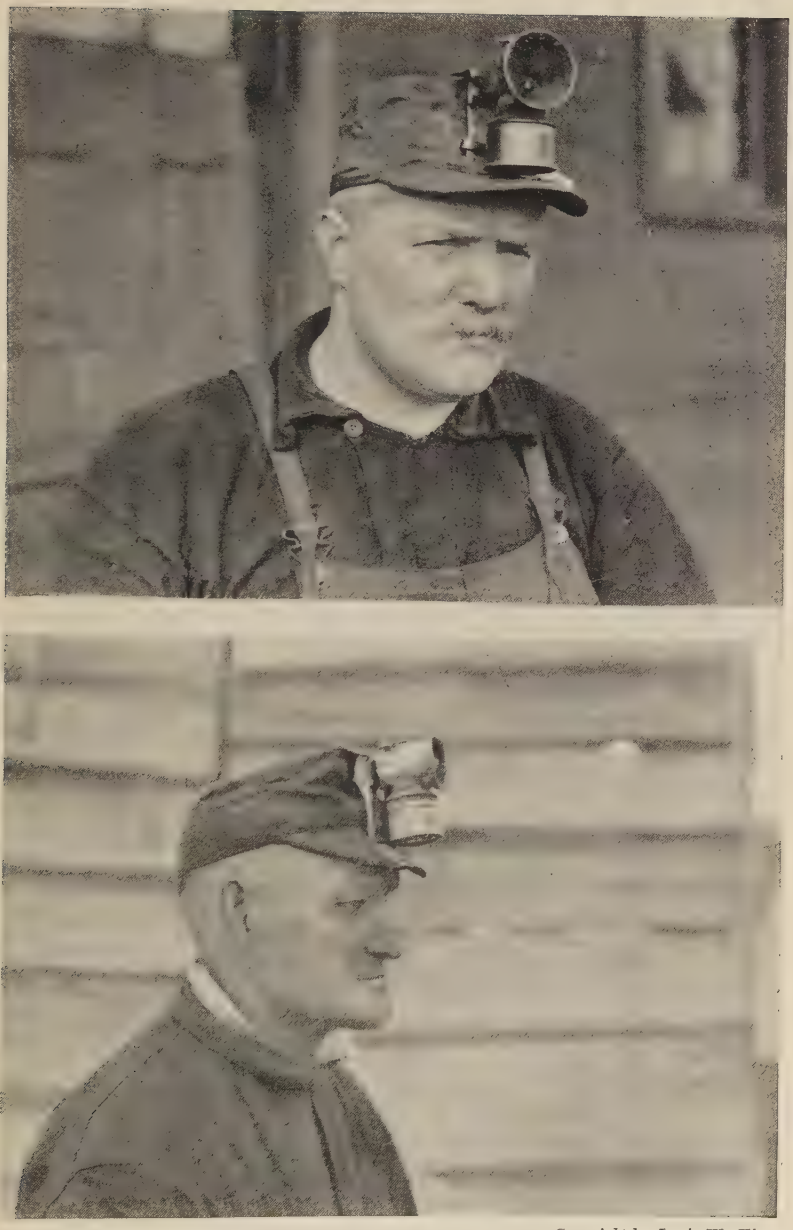
CHAPTER VIII

Better Adjustment of Mining and Transportation

Car shortages. The railroads of this country have been and are equipped to carry a normal tonnage of coal from the mines to market. Nearly 90 per cent of the soft coal produced requires transportation to markets away from the mines, and 97 per cent of the transportation is by railroad. Transportation, therefore, may limit production. When it does there is said to be a "car shortage," though the deficiency is often as much in locomotives as in cars and the trouble often is due to congestion in railroad yards and terminals.

When coal mines get orders for coal, they order cars in which to ship the coal. When there are not sufficient cars supplied to fill these orders the buyer cannot get all the coal he has ordered or contracted for. The car shortage results in a coal shortage. Distribution and the ordinary course of trade are disorganized. The rising price of coal furnishes the incentive for the opening of new mines and reopening of old ones. Whereas, there had been less than 300 new mines opened per year in the six years prior to 1916, there were 454 new soft coal mines in 1916, 1,285 in 1917, 1,573 in 1918 and 1,058 in 1919. Each of the going mines sought to enlarge its capacity. Coal buyers placed orders wherever they could, often duplicating, sending agents out and giving employment to a host of new coal jobbers and brokers.

There are just so many railroad cars each day to be given to the coal mines. When the orders for cars exceed the number available the supply is prorated among the mines, the idea being to give each mine the same number of hours work per day or per week. As more mines demand cars, the railroads being bound by law to parcel the supply without discrimination, the older mines are given less. A mine able to produce 10 cars per day, when there is 80 per cent car supply, gets 8 cars, with 50 per cent car supply, gets 5 cars. The only way to get more cars is



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TYPES OF MINERS

to increase mine capacity and thereby become entitled to a larger proportion. The result of this method was that when every operator made this endeavor none could profit much thereby. There was a scramble for men to increase daily capacity. The newer mines had the advantage in part because of easier work and in part because they paid wage bonuses. The old established companies lost ground.

Overdevelopment. The fact of overdevelopment is stated most simply and most commonly by saying that, whereas the maximum annual demand for bituminous coal, as measured by production, was 579,000,000 tons (in 1918) and for the 5 years, 1917-1921, averaged 516,000,000 tons, the mines are equipped and manned to produce from 700,000,000 tons at the lowest estimate, upward to more than 800,000,000 tons of bituminous coal per year. For brief periods, a few days or a week at a time, production has been approximately at the peak, but throughout the greater part of each year the coal that is required to satisfy the requirements of the country is produced by part time operation of the soft coal mines.

The logical test of overdevelopment and the fair measure of its extent is not, however, comparison of annual production with annual capacity, but rather peak demand against capacity. So long as there is a variable demand for soft coal, ranging from high to low from any number of causes, there will be necessity for mine capacity to meet the higher rate of demand. It is common to argue that if the soft coal mines in 1920 produced 568,000,000 tons, working 220 days, they could have produced 795,000,000 tons working 308 days or, theoretically, full time. An average of 290 days would have given 750,000,000 tons, according to the same method of calculation. On this basis the overdevelopment is around 40 per cent. By the same reasoning it was 44 per cent in 1910 and 33 per cent in 1913. In the years of depression following these peaks, the ratio of capacity to production is, of course, much greater, but not significant; neither is an average over a period of years, which includes these low points.

If, however, the ratio of capacity to production be taken with respect to the month of maximum demand in the year, the figure

is different. Thus in 1910, maximum demand and output were reached in October. This was at the rate of 470,000,000 tons per year, as against a production of 417,000,000 tons. Theoretical, full-time capacity, 590,000,000 tons, was 25 per cent over the maximum monthly rate and 44 per cent over the actual annual output.

In 1913 the theoretical capacity was 15 per cent over the maximum monthly rate of production. In 1920, a year of maximum demand, by the same method of calculation, the industry was 24 per cent overdeveloped.

Until it is to the economic advantage of producers to sell and of consumers to buy their soft coal in approximately equal monthly installments throughout the year, there will be months of maximum demand for which there must be mine capacity to correspond. The true measure of overdevelopment is the amount of capacity over and above that maximum monthly rate of production at present around 24 per cent, and not the 40 per cent obtained by comparing full-time capacity with average production.

Capacity to produce over and above that necessary at times of peak demand is inexcusable. It would be better business for the country, as well as for the soft coal industry, for idleness of mines to be confined to those periods when demand is least, and for the peak demand to be met by intensive operation of all mines. As it now is many operators are on the ragged edge of insolvency much of the time and only desist from closing out permanently in the hope and expectation that a strike or severe car shortage will bring on a temporary flurry in prices by which they may recoup.

There is an important difference between overcapacity and overproduction. Bituminous coal is not stored in quantity at the mines and overproduction can only come to pass when the consumers have exceedingly large stocks in excess of their current requirements. Such was true early in 1919. Normally, production and transportation of bituminous coal are practically simultaneous and depend on demand and orders. Overcapacity means potential overproduction that overhangs the market when there is no lack of transportation; that is, in periods of car surplus.

Types of Miners

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Causes of Overdevelopment. The primary cause of overdevelopment, as previously stated, has been intermittency of operation, which in turn is the product of irregular demand and of large scale strikes of mine labor. Heavy demand for coal has alternated with slack demand. Orders for soft coal have been concentrated in the fall and winter through lack of adequate storage at the points of consumption, and the railroads have not been able, notably in recent years, to move the coal as it was ordered from mine to destination at such times. High prices have resulted; the opening of more mines has been encouraged. The speculative possibilities of recurring periods of high prices have thus been dangled before the eyes of the owner of every piece of virgin coal land.

The ease with which a bituminous coal mine can be started has encouraged new developments. The railroads tapping the coal fields have competed for prospective tonnage from new fields, and by rate adjustments have expanded markets for the operators on their lines. One of the early acts of the Interstate Commerce Commission was to make it impossible for a railroad to refuse a new mine an outlet over its rails. Despite the hazards of the occupation, there has never been a general lack of coal mine labor. There have always been jobbers and wholesalers to take over the selling of the coal from these new mines and to finance the operation if the enterprise were not strong enough to undertake the marketing of its own product.

The rules now in effect governing the distribution of coal cars among the mines have encouraged overdevelopment, for by dividing the cars according to capacity to produce, these rules have put a premium on overcapacity. Because of the uncertainties in coal supply experienced since 1916, large consumers have bought coal land and opened many new mines.

There has been nothing in the history of the bituminous coal industry to discourage overdevelopment save the losses sustained in the competitive fight for business. The lack of concentration of ownership of the soft coal mines—there are three mines for every two operating owners—coupled with this overdevelopment, has resulted not in the permanent closing of some of the mines,

but in the operation of all more or less intermittently, even in the dullest periods.

Overdevelopment can be reduced to an economic minimum only by the correction of these causes.

The long haul on coal. By a gradual process, beginning half a century ago, freight rates on coal have been built up to the present complicated structure. At first those fields close by the natural location of coal-consuming industry were opened, or industry grew up around rich coal deposits, the coal-producing and coal-consuming industries developing together in a logical relationship.

Later, other coal deposits of high quality were discovered, railroads built and mines opened remote from industrial markets and large centers of population. Under the pressure of demand for the development of coal traffic from these new fields over these newer railroads, freight rates were established sufficiently low to permit the distant coal to compete in large markets with other, nearer coal. The rates on these long hauls were established without adequate regard to the cost of the transportation service rendered. Thus, much of the soft coal that is now produced and consumed in this country is transported undue distances, in many instances on its way to market passing across other fields producing coal of similar character. That these long-haul coals, as those of southern West Virginia, eastern Kentucky and southern Illinois, are of high quality, has added to the facility with which they have encroached on the natural markets of the older fields.

There is little dispute of the fact that the differentials in rates, early established and but slightly modified since, by which these remote coals are able to enter the large consuming markets, do not reflect the differences in cost of transportation. It is equally apparent that the long haul brings about a dilution of coal car equipment and other transportation facilities. Since in the aggregate the consumers must pay the total cost of all transportation, whatever actual loss or inadequate return is incurred as a result of these long hauls on coal is paid for in the rates on other coal or other commodities.

During the war artificial zoning of coal shipments was adopted, having as a double purpose the saving of transportation and the

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TYPES OF MINERS

control of distribution. Such arbitrary restriction of markets can only be justified by such an emergency. There is adequate opportunity, however, for the proper control of distribution and the maintenance of natural limits on the markets in which the coal from each field may successfully compete for its share of the going trade through freight rates.

The inevitable result of an overdeveloped soft coal industry is that each field is seeking to widen the territory in which it can market its product. If the cost of production cannot be lowered the effort is to have the freight rate reduced relative to the rates from other competing fields. It is against this tendency that the country must set its face. The conditions that have grown up through half a century cannot, however, be reversed in a day. The investment in railroads and coal mines, fostered by a policy of making rates that permit competition without regard to the compensation to the carrier in the rates, cannot be set at naught in any sudden manner.

On the contrary, gradually and without undue violence to established conditions, the rates should be readjusted to re-establish more natural relations between the elements of coal and service. The result will be a reduction in the total cost of transportation to the nation. This proposal is apparently in line with recent decisions of the Interstate Commerce Commission.

Consolidations. The Commission found that a limitation of marketing area by the adjustment of freight rates to express the true relation of cost to service, with a voluntary division of territory on economic lines was only part of the solution. The consolidation of mining companies, grouping or pooling mining operations, it found was also necessary and recommended that the Government should not simply permit, but actually encourage such consolidations, with a view to securing more steady production, less speculative prices, a wider use of long term contracts with consumers, better living conditions, more regular employment and lower costs. The Commission pointed out that consolidations may be utilized to combine low and high cost mines, keeping the latter in reserve for periods of emergency and limiting to low cost mines current operation when the demand is normal.

Commercial ratings. The Commission recommended that in future in determining the rating of a mine for the purpose of car distribution, consideration should be given to the commercial ability of the mine to sell its production as well as to its physical capacity to produce.

In the years before the war certain of the important coal-loading railroads did give consideration to commercial ability as well as to physical capacity. In the course of the development of coal car distribution rules during the war and post-war periods, reliance upon commercial ability to sell and ship coal was discarded. This was probably a natural result of the fact that over a long period during those years there was a ready market for practically all the bituminous coal which could be produced and transported.

But in the future when long periods may be expected when the market cannot by any means absorb the potential production, there is good reason for again considering commercial ability to sell, as well as physical capacity to produce bituminous coal, in determining the rating of a mine for car distribution purposes. The Commission recommended that in determination of such ratings in the future, the commercial factor should be given a controlling influence, believing as it did that such action is necessary to effect relief to the industry and the consuming public.

The Commission argued that such a system of car distribution would furnish incentive to the producer to operate during dull seasons, and so distribute more evenly the transportation load throughout the year; that it would give the consumer an incentive to buy and receive coal above actual current requirements in dull seasons; that it would remove the incentive to secure preference in the use of transportation facilities at certain periods by the use of the assigned car; and that it would mitigate the effects of car shortage by reducing its amount. Its tendency to reduce the existing overdevelopment of the industry was also stressed.

The Commission's conclusions as to the relation of overdevelopment and transportation are summarized in Chapter XV.

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Coal Cars

PART II —ANTHRACITE

CHAPTER IX

Wherein Anthracite Differs from Bituminous Coal

The anthracite coal resources of the United States[1] are confined to an area of less than 500 square miles in the mountainous counties of northeastern Pennsylvania. Geologically this area is divided into four fields: (1) The Northern, or Wyoming Field, extending from Forest City to Shickshinny, a distance of 50 miles, with a maximum width of six miles; (2) the Eastern Middle Field, lying about 15 miles south and southeast of the western end of the Northern Field, with a maximum length of 26 miles and a maximum width of ten miles; (3) the Western Middle Field, lying southwest of and adjoining the Eastern Middle Field, extending 36 miles in length and four to five miles in width; and (4) the Southern, or Schuylkill Field, extending from Mauch Chunk to Dauphin, a distance of 70 miles, with a maximum width of eight miles. A number of small, detached areas, including the Bernice basin[2] in Sullivan County, lie northwest of the Northern Field.[3]

The more common trade classification divides the region into three fields: (1) The Wyoming, as just described; (2) the Lehigh, comprising the Eastern Middle Field and the eastern end of the Southern Field from Mauch Chunk to Tamaqua, known as the Panther Creek basin; and (3) the Schuylkill Field, which comprises the Western Middle and that part of the geologic Southern Field west of Tamaqua.[4] These fields are frequently referred to as the Northern, Middle and Southern.

[1] "Anthracite" as used in this chapter refers only to the hard coal of Pennsylvania. Cf. Chap. II, Note 1. Some anthracite coal is found in Colorado and New Mexico.

[2] Authorities disagree as to the status of the Bernice basin: Many decline to recognize the coal as true anthracite. Sullivan County statistics usually are shown separately in trade and Government reports: where not so shown, they are included in the figures for the Wyoming field.

[3] Jones, The Anthracite Coal Combination in the United States, p. 5.

[4] U. S. Geological Survey, 22nd Annual Report, Pt. III, pp. 63-64.

The anthracite coal measures felt the full force of the great continental thrust that caused such upheavals and changes in the topography of the North Atlantic States. The continuity of the coal beds was not only broken by faults, but in many places the coal-bearing rocks were so folded and crushed that a cross-section shows the coal seams in undulating position. In some other parts of the region the gentle roll has been replaced by sharp curves, and in parts of the Schuylkill region the coal beds are perpendicular or tilted backwards. The beds range in thickness from a little over a foot to the great Mammoth bed, which in some parts of the region reaches a width of 50 feet.[5] The coal fields are canoe-shaped basins or troughs, with the distortion of the beds increasing from north to south. With one exception the thickness of the coal measures also increases in the same direction, being greatest in the Southern Field,[6] less in the Middle Western and still less in the Northern Field.[7]

As in bituminous coal,[8] the pitch and the contour of the seam and the depth of the overburden influence the character of the openings of the mines in the anthracite region. But many mines do not depend upon a single opening or upon a single type of opening in winning the coal. A check of 192 operations for which data are available, principally in the Northern Field, shows 43 shaft openings, 35 slope mines, 13 drift and three stripping operations.[9]

In addition to the mines proper there are also washeries for the preparation of coal from the culm banks and dredges to recover the merchantable fuel washed into the rivers from wrecked arks and the substantial quantities dumped into the streams in preceding generations because there was then no market for the smaller sizes. The culm banks have been built

[5] If the three splits of the Mammoth bed and intervening strata be considered as one bed, the thickness reaches 125 feet.

[6] The thickness there approximates 2,100 feet.

[7] It has been estimated that only 6 per cent of the original deposits was left untouched by the destructive forces of nature.

[8] See Chap. II, p. 55.

[9] All anthracite figures, unless otherwise specified, are in gross tons.

of the incombustible impurities removed in the process of preparation and of the small sizes that could not be sold. While little combustible material goes to the culm bank today, that was not always so. There was a time when chestnut, now so esteemed by the western household consumer, was unmerchantable. The Civil War was over before a market was established for the next smaller size, pea, and the commercial advent of the other small coals is still more recent.[10]

Preparation of anthracite. With the bituminous operator the sizing of coal[11] was adopted in the first instance to win a competitive advantage. With the anthracite operator preparation and sizing have been physical as well as commercial necessities. Anthracite mine-run as loaded at the working face will vary in size from fine particles to blocks that will weigh one hundred-weight or more. When the coal reaches the immense topworks known as "breakers" it is necessary to put the mine-run, after a preliminary screening, through crusher rolls to break up the larger lumps before the fuel can start its serpentine course over shaking screens and winding chutes.

Anthracite coal is prepared in nine or more sizes. The largest pieces, usually screened out before the mine-run goes to the first set of crusher rolls, are called lump or steamboat lump. The next larger size, broken, is used by gas utilities and a few industrials and is purchased occasionally by enterprising retail dealers, who reduce it to the more popular egg, stove and nut (chestnut) sizes. The three sizes last named constitute 57-65 per cent of the total shipments and are used by the domestic trade. Pea, the next smaller size, representing between eight and nine per cent of the commercial output, was originally a steam coal. It is now classed as a domestic fuel. The next three sizes,[12] No. 1 buckwheat, No. 2 buckwheat or rice and No. 3 buckwheat or barley, make up about 25 per cent of the shipments. A number of

[10] No. 1 buckwheat did not begin to enter the market as a commercial factor until the '80s, No. 2 until the '90s and No. 3 still later.

[11] See Chap. II, pp. 49-51.

[12] The generally accepted standards of sizing and preparation are as shown on p. 286.

SIZE	SQUARE HOLE SCREEN		ROUND HOLE SCREEN	
	Through	Over	Through	Over
	inches	*inches*	*inches*	*inches*
Egg	$2\frac{3}{4}$	2	$3\frac{1}{8}$	$2\frac{1}{4}$
Stove	2	$1\frac{3}{8}$	$2\frac{1}{4}$	$1\frac{9}{16}$
Chestnut	$1\frac{3}{8}$	$\frac{3}{4}$	$1\frac{9}{16}$	$\frac{7}{8}$
Pea	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{7}{8}$	$\frac{9}{16}$
Buckwheat	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{9}{16}$	$\frac{5}{16}$
No. 2 Buckwheat (Rice)	$\frac{1}{4}$	$\frac{1}{8}$	$\frac{5}{16}$	$\frac{3}{16}$
No. 3 Buckwheat (Barley)	$\frac{1}{8}$		$\frac{3}{16}$	$\frac{3}{32}$

The percentages of foreign matter (impurities) allowed are as follows:

	BROKEN	EGG	STOVE	CHESTNUT*	PEA	BUCKWHEAT
	per cent	*per cent*	*per cent*	*per cent*	*per cent*	*per cent*
Slate	1	2	4	5 to 7	8	10
Bone	2	2	3	5	10	10

* Chestnut may contain from 12.5 to 15 per cent of pea.

During the war the Pennsylvania Fuel Administration set up the following standards of over and undersizing: Egg, stove and chestnut could contain not over 5 per cent of the larger sizes; chestnut, not more than 10 per cent of pea and 5 per cent of No. 1 buckwheat; pea, not more than 15 per cent of No. 1 buckwheat and 5 per cent of rice; No. 1 buckwheat, not more than 15 per cent of rice.

The percentages of the total *shipments* that each size made during 1919-21 were as follows:

SIZE	1919	1920	1921
	per cent	*per cent*	*per cent*
Lump	0.3	0.1	*
Broken	4.2	4.8	3.6
Egg	14.2	14.5	14.7
Stove	19.6	18.0	21.1
Chestnut	25.6	25.2	26.8
Pea	9.1	8.0	8.4
No. 1 Buckwheat	12.5	13.4	13.4
No. 2 Buckwheat	7.4	8.0	6.5
No. 3 Buckwheat	5.2	5.7	4.6
Boiler	0.8	1.2	0.4
Other sizes†	1.1	1.1	0.5

* Less than 0.1 per cent.

† Includes culm, No. 4 Buckwheat, screenings, settlings, silt, mine-run, dirt and slush. Mineral Resources of the United States, 1921, Pt. II, p. 621.

smaller sizes, including boiler, No. 4 buckwheat, culm and screenings, aggregate less than two per cent of the shipments.[13]

The anthracite railroads. Approximately 70 per cent[14] of the anthracite shipments reach the domestic trade. Because this class of consumption is swayed only slightly by industrial changes, the anthracite business as a whole is marked by a stability that is not found in the bituminous coal industry. Other factors that have helped to create this steadiness are the past history of the exploitation of the anthracite field and the character of the operating organization this has developed. In many of the bituminous regions the opening of new mines followed the construction of railroad lines. In the anthracite region transportation facilities were developed as an adjunct to winning the coal. The transportation systems first built up in the Wyoming and Lehigh Fields were subordinated to the major operating interests in those fields. As independent railroad lines penetrated these sections they sought to measure up to their older rivals by acquiring coal holdings. In the Schuylkill Field, however, transportation and mining were conducted as two independent and unrelated activities until the early 70's. The first struggle in that field was between railroads and canals to determine which should dominate the physical transportation of coal.[15] Later the railroads and their affiliated coal interests acquired by far the bulk of the undeveloped coal acreage and a majority of the working operations. This control was further strengthened by the purchase of coal produced by non-railroad operators. At the peak of this period of control the railroad interests produced approximately 75 per cent of the tonnage mined and controlled 90 per cent of the unmined reserves. According to figures compiled by the Government at the time suit was instituted to break up this control the railroad interests were producing 78.04 per cent of the tonnage, purchased 10.22 per cent of the total (or nearly 46.7 per

[13] On an output basis the percentage of smaller sizes would be larger because large quantities of the small sizes are used for mine fuel; the quantity so used approximates 11 per cent of the total output.

[14] In arriving at these figures, broken and lump have been excluded and pea included in the domestic sizes.

[15] Annual report of the Reading R. R., 1881, p. 62. Daggett, Railroad Reorganization, p. 38.

cent of the non-railroad controlled output) under perpetual contracts and another 3.4 per cent under short contracts, leaving only 8.7 per cent of the production free in the common meaning of that word.[16] The perpetual contracts were subsequently declared invalid by the Supreme Court of the United States.[17] Still more recently the courts have compelled the segregation of several of the railroad and mining corporations.[18] The coal produced by the railroad companies and their subsidiaries has been known in the trade as "company" coal to distinguish it from the "independent" tonnage mined by companies with no direct railroad affiliations.

During the years in which the foregoing changes were taking place the anthracite industry was undergoing the same throes of overdevelopment that is now the lot of the bituminous coal trade.

What stabilization has done for production is illustrated in the output for the ten years ended December 31, 1921. That period included wide fluctuations in general business conditions, some extremes in weather and two comparatively brief general suspensions in the anthracite region. Production was lowest in the strike year of 1912, when it dropped to 84,361,598 *net* tons; highest in the war year of 1917, when it reached 99,611,811 *net* tons. During the same decade bituminous coal production fell as low as 422,703,970 tons in 1914 and reached a maximum of 579,385,820 tons in 1918. The 1917 anthracite tonnage represented an increase of 17.8 per cent over the low output of 1912. The 1918 bituminous coal production showed an increase of 37.0 per cent over the 1914 tonnage.

Were the unusual elements, such as the strikes and the war, eliminated the fluctuations in yearly anthracite output would be narrowed still more.

Distribution. The marketing of the steam sizes is the major problem that normally confronts the anthracite producer. The steam sizes (the buckwheats) must be sold in competition with bituminous coal, which is superior for general industrial pur-

[16] Transcript of record in U. S. vs. Reading Co., et al., vol. III, Exhibit 170.

[17] United States vs. Reading Co., et al., 226 U. S., 324.

[18] The Pennsylvania R. R. sold its interest in the Susquehanna Collieries Co. to M. A. Hanna and Company.

poses, particularly in plants where there are sudden and unexpected changes in load. The largest market for the buckwheats is in New York and Philadelphia. Outside of these cities the primary distribution is limited to territory within a 100-mile radius of the mines. The f. o. b. mine price at which this coal must be sold, if it moves at all, is considerably less than the cost of production. The loss thus incurred is carried by the domestic sizes.

That, however, is not the only burden the steam production lays upon the domestic output. It is also a limiting factor upon total output. The steam sizes are the inescapable by-products of the preparation of anthracite coal for the domestic market. To dump them on the culm pile, as was done in earlier years, would be an economic waste that no longer would be justified. The larger producers endeavor to maintain production in periods of slack demand by placing the buckwheats in storage.[19] The smaller pro-

[19] In Federal Trade Commission, Cost Reports—Coal No. 2, p. 27, the following data covering storage placements and withdrawals by a group of operators having an annual output of approximately 42,000,000 tons are given:

PERIOD	PLACED IN STORAGE		WITHDRAWN FROM STORAGE	
	Domestic	Steam*	Domestic	Steam*
	gross tons	*gross tons*	*gross tons*	*gross tons*
1915				
January–March	537,239	—		323,076
April–August	433,936	1,063,897		—
September–December	—	—	408,658	553,244
1916				
January–March	—	—	872,070	1,331,300
April–August	94,537	188,698	—	—
September–December	—	—	1,079,501	1,099,527
1917				
January–April	—	—	271,121	679,163
May–August	177,584	230,508	—	—
September–December	—	—	137,601	131,579
1918				
January–March	—	—	186,208	208,314
April–August	52,492	22,382	—	—
September–December	—	368,938	37,094	—

* Includes pea coal.

ducers without storage facilities must shut down if they cannot move their steam coal.

The field of distribution for the domestic sizes of anthracite is in striking contrast to the narrow confines of the steam hard coal market. Nearly every State in the Union takes some domestic anthracite in a year of normal distribution, the quantities ranging from a few tons in Idaho to over 12,000,000 in New York. Statistics covering the distribution of approximately 90 per cent of the domestic shipments for the coal year ended March 31, 1922, showed the Middle Atlantic States taking 25,618,926 tons; the New England States, 6,429,471 tons, of which more than half was shipped to Massachusetts; the Northwestern States, 3,281,-107; the Central States (Ohio, Indiana and Illinois), 2,381,607 tons; 23 States south of the Potomac and west of the Mississippi River took 406,577 tons. Canada received 4,035,014 tons.[20] Small quantities are also exported to Cuba, Mexico and other foreign countries.

The number of bituminous coal producers runs into the thousands.[21] In 1920, when the output of soft coal was 568,866,683 tons, there were 12,122 operators, with 14,766 mines. Anthracite production the same year totaled 89,598,249 *net* tons and engaged the activity of 174 operating organizations with 252 breakers, 62 washeries and 60 dredges. The contrast is vividly set forth in the following table, which is based upon data collected by the United States Geological Survey.[22]

The channels of distribution through which anthracite moves to the consumer are the same as those through which the bituminous coal moves.[23] The "railroad" group of producing companies, whose output approximates 73 per cent of the annual tonnage mined, distribute to the retail dealer through their own sales departments selling direct; through separately organized subsidiary

[20] Testimony of E. W. Parker in hearing on Interstate Commerce Commission Docket No. 14624.

[21] See Chap. II, p. 68.

[22] Duncan, Coal Marketing, p. 19.

[23] See Chap. II, p. 74.

sales companies that market the output, and through selling the bulk of their output at the mines to wholesale companies who act as their sales agents.[24] The "railroad" interests also sell domestic coal to independent wholesalers for distribution in territories in which the producing company is without direct representation and as an inducement to the jobbers to push the sale of the steam coals.

The growth of "independent" operations in the anthracite region has led to groups of separately incorporated producing companies that have a complete or partial common ownership. Each of these groups has a selling company which markets the

TABLE 59

SIZE CLASS*—OPERATORS PRODUCING ANNUALLY	NUMBER OF PRODUCERS IN EACH SIZE CLASS		PER CENT OF TOTAL OUTPUT IN EACH CLASS	
	Anthracite	Bituminous	Anthracite	Bituminous
Less than 10,000 tons	47	8,194	0.2	2.4
10,000 to 49,999 tons	38	2,121	1.0	9.4
50,000 to 99,999 tons	21	727	1.8	9.0
100,000 to 499,999 tons	50	891	13.6	31.8
500,000 to 999,999 tons	5	109	4.4	13.2
1,000,000 to 4,999,999 tons	9	76	30.2	27.1
5,000,000 tons and over	4	4	48.8	7.1
Totals	174	12,122	100.0	100.0

* Bituminous tonnage net; anthracite gross.

output of the members of the group, selling direct to the retailer, the industrial consumer and to the wholesaler.

Very little domestic anthracite is sold on formal contract. Instead, between the old line (railroad) producers and the retailers there has grown up a relationship just as definite and more binding in actual practice than that set up in written agreements.

[24] In New York, Philadelphia, and certain other eastern cities, the retail dealer delivers a large tonnage of the buckwheats to office buildings, hotels, apartment houses and industrial consumers without facilities to take coal direct from the mines or the wholesalers. This increases the percentage of the output moving through retail trade channels.

Under this relationship the retail trade takes stated tonnages, usually in the monthly proportions determined by the producer or his sales agent year in and year out. A retailer working under such an arrangement is said to have "company connections" and his status is the envy of competitors not so situated. What makes such a connection valuable to the retailer is the assurance which it carries of price stability. It is the general practice among the old line companies to name a price, either fixed or on a sliding scale, to govern the domestic sales of the month or the season, and, with rare exceptions, this price is adhered to regardless of market conditions.

Public interference with the anthracite industry. If concentration of ownership has had its advantages from the standpoint of stabilization, it also has had the disadvantage of attracting public scrutiny. Until a few years ago few people outside the coal business paid much attention to bituminous operations, but the anthracite industry has been under intermittent attack for nearly a century. Coal control of transportation facilities (which, incidentally, has practically eliminated car shortage from the operating problems of the anthracite producer), labor relations, concentration of operating interests and prices have been the subjects of State and national legislative investigations and court and commission proceedings.

The first move in war-time control [25] antedated the enactment of the Lever law and was undertaken by the Federal Trade Commission. Its purpose was to check sky-rocketing prices on independent coal, and to prevent diversion of domestic anthracite into industrial channels. As the lesser of two evils the Federal Trade Commission conceded the right of the independent operator to a differential over company circular and endeavored to hold the surcharge to a reasonable basis. When the Fuel Administration came into power the scale of prices on domestic sizes promulgated by the Government was, with one or two minor exceptions, the current Reading circular reduced to a mine basis. Fol-

[25] See Chap. II, pp. 78-80.

lowing the precedent made by the Federal Trade Commission, the Fuel Administration also authorized a premium on independent tonnage, fixing the maximum differential at 75 cents per ton over company prices.

In this manner Government sanction was given to the destruction of the price uniformity that the dominating interests in the anthracite region had been years in building up.[26]

Instead of an elaborate zoning system,[27] regulation of distribution during the war control period was left in the hands of a committee of anthracite operators whose scheme of apportionment of domestic tonnage was approved by the Fuel Administration. This scheme was based upon normal distribution, with adjustments to take care of increased demand in the East made at the expense of other sections of the country that could more readily draw upon the bituminous coal fields.

During the second period of emergency regulation[28] anthracite was free from control. In the third period[29] an effort was made to include independent tonnage in the voluntary price control schemes. Regulation of both distribution and prices was undertaken in the fourth period of emergency regulation[30] by the Pennsylvania Fuel Commission,[31] to which body the Federal authorities deferred in the matter of anthracite. An unsuccessful effort was made by New York and New England interests to have the Interstate Commerce Commission embargo shipments to Canada.[32]

As in the case of bituminous coal, the strikes and high prices exacted during times of stress on a small proportion of the total tonnage led to demands for Government investigation. In addition, one of the terms of the settlement of the 1922 strike was

[26] See Chap. IX, p. 287.
[27] See Chap. II, p. 80.
[28] Ibid, pp. 81-83.
[29] Ibid, pp. 83-85.
[30] Ibid, pp. 85-86.
[31] A semiofficial body appointed by the governor of the state.
[32] Interstate Commerce Commission, Docket 14624.

that a Government commission inquire into the facts relating to the industry and make its recommendations in time to be available for the next wage negotiations. The data developed by the United States Coal Commission in the investigation that followed are considered in subsequent chapters.

CHAPTER X

The Anthracite Miners

A large part of the anthracite problem, like the problem of the bituminous industry, lies in labor relations. Hence, the Commission studied the conditions of labor in the anthracite regions; the make-up of the mining population; how it compares with the bituminous population; wages; hours; employment; earnings, and standards of living.

1. THE ANTHRACITE MINE-WORKERS AND THEIR ENVIRONMENT

About 147,500 men who work in the coal mines live in the small, compact anthracite coal fields, where the communities, large and small, lie like a string of beads between ranges of low mountains, around the foot-hills and along the streams. Steam and electric railways, good roads, inter-urban telephone connections, creating and maintaining constant intercourse, are the cords which bind these communities together. It is not surprising, then, to find that 70 per cent of the anthracite mine-workers live in incorporated towns with a population of 2,500 or over; that the great majority of the others are in unincorporated, but independent communities of 500 to 2,500 persons; that more than 90 per cent of the men live in houses not owned by the coal companies; that nearly nine-tenths of the small proportion who do live in company-owned dwellings are in houses that are either located within the limits of incorporated towns or are not as much as five miles from such towns; and that the company-owned houses do not constitute 5 per cent of the family dwellings in the communities in which such company-owned houses are located.

Whatever the conditions of living, however ample or meagre the facilities for healthful and comfortable family and community life, it is obvious that neither isolation from normal, independent communities nor dependency upon company housing can be regarded as a factor in the results.

The anthracite mine-workers and their households, numbering nearly half a million persons, constitute over 48 per cent of the population of the counties in which the principal hard coal fields lie. Barring Scranton and Wilkes-Barre, the anthracite mine-workers themselves are 45 per cent of all the wage-earners living in the same communities. With these other wage-earners and their families, therefore, the anthracite mine-workers and their households bear equal responsibility for the conditions of life in the self-governing communities. It is true that the coal companies, through the great wealth they control, acquire a greater influence, and consequently a greater obligation to maintain exemplary conditions on the housing properties and in the communities they control. It is equally plain from the data collected by the Commission, including the information submitted by the Public Health Service, that while some companies are fulfilling this obligation, the majority are trailing rather than leading the progress toward better homes and better communities, and that some of the conditions stamp the sponsors as nurturing social malignancies. But the company-owned houses and company-controlled communities are too few in number to fix the level of conditions in the independent communities which abound in the anthracite region.

Civic status. Of the 147,500 anthracite workers, 78,000, or about 53 per cent, are foreign-born, 42,000 coming from Russia and Poland. Almost 97 per cent of the foreign-born have been in this country five years or more. Over 29 per cent neither read nor write, and 14 per cent of those coming from non-English speaking countries do not speak English—two facts which, as in the case of the bituminous mine-workers, are of great importance in the problem of national assimilation and of industrial hazard. More than 34,000, or 44 per cent of the foreign-born, were still alien in 1920. Not as many as a thousand of these were under 18 years of age, the age at which first papers can be taken. An additional 10,500 of the foreign-born had taken out first papers only, so that less than half of all the anthracite mine-workers born overseas were American citizens in 1920.

Family responsibilities. Over 68 per cent of the foreign-born and 44 per cent of the native-born anthracite mine-workers are

maintaining homes in the anthracite region. Over a third of the foreign-born own in part or in whole the houses in which they live, as compared with less than 29 per cent of the native-born.

Of the foreign-born mine-workers maintaining homes and having children of school age, two-thirds have children of such ages at school. In the homes of all foreign-born anthracite mine-workers there are approximately 200,000 children.

In 60 per cent of the homes of all the anthracite mine-workers there are families of five members or less, counting only parents or those standing in the place of parents and the children. As might be expected, the families of the foreign-born are frequently larger than those of the native-born, over 47 per cent of the former, as compared with 27 per cent of the latter, having six or more members in the immediate family.

Over half of all the anthracite mine-workers—62 per cent of the native-born and 51 per cent of the foreign-born—are the sole breadwinners of the family. About a fifth are taking boarders or lodgers—23 per cent of the foreign-born and 16 per cent of the native-born.

Less than one-half of one per cent of either foreign-born or native-born have wives who are gainfully employed outside of the home. Over a third have the help of children 14 years of age or over.

Manifestly, the anthracite mine-workers, like the men at work in the bituminous fields, have normal family responsibilities. But their material environment is a matter of civic progress and economic status rather than a question of the operator's standards as to the conditions which should surround the men—and the families of the men—who must live in his houses while working in the mines.

2. INCOME AND DISBURSEMENTS OF ANTHRACITE MINE-WORKERS' FAMILIES

Was the anthracite mine employee financially able to obtain the necessaries and comforts of life for his family at the wage rates prevailing in 1922?

To answer this question, information concerning the income

and expenditures of 910 anthracite mine-workers' families was procured, in part from mine-workers and their wives and in part from the records of companies, service corporations and retail stores.[1] As all mine employees except maintenance men were out of work for at least 163 days in 1922, this study was confined to the six months just prior to the date of scheduling, or from October 1, 1922, to April 1, 1923. Three-fifths of the men whose family disbursements were studied worked the entire twenty-six weeks in this period; about one-fifth worked from twenty-two to twenty-six weeks; only twenty-three were employed in the mines less than half the period between October and April.

Naturally, in a period following a strike of such length, the effect of months of no income is to be seen. Bills for credit extended at grocery stores, back rentals, unpaid doctors' bills and borrowed money were due after the strike period. Then again, these were winter months, when fuel had to be purchased in greater quantities than it would have been for a twelve-months' period. Christmas also increased miscellaneous expenditures. Consequently, the average disbursements per month in the period studied are probably slightly higher than disbursements per month during a twelve-month period of employment.

If all income received by the mine-workers' families visited had been equally divided, each would have had about $175.89 in each month from October 1, 1922, to March 31, 1923. One hundred and forty dollars and some odd cents of this income were derived from the father's net earnings in or about mines; $14.25 were the mother's earnings from boarders; $19.02 were children's earnings; $1.53 was income from house rentals, and $0.66 was the average amount derived from investments other than houses—from produce sold or from accident compensation.

[1] The number of schedules that could be secured in the time allotted to the study was divided among the three districts in the anthracite field, and each district's quota subdivided according to number of miners living in cities of varying population. The names and addresses of mine-workers to be scheduled were taken from U. S. Census records, such names and addresses being divided as three to one between miners and other skilled employees and mine laborers.

But as an actual fact there was much diversity in the income of different families. Forty-one in every hundred visited had $176.00 or more with which to meet expenses. Sixty in every hundred had between $100.00 and $150.00 income. About eight in every hundred had less than $100.00 a month from October to March 31, 1923, with which to support themselves and families. The men with the smaller incomes were men who had not had many weeks of employment during the period covered.

The possible earnings of the miners are well known to merchants and other persons serving the anthracite communities. Consequently, incomes and disbursements of anthracite miners' families were closely related. Families having an income of less than $100.00 per month spent $85.00 on current needs; families with incomes from $100.00 to $150.00 spent $120.00 on current expenses; families with $150.00 to $200.00 incomes spent $165.00, and families with incomes of $200.00 and over spent $248.00 per month on current needs. In like manner the amount paid on accrued debts increased as the income increased, and the amount of money available for savings or investment advanced rapidly with the larger income. In each income group, however, there were some persons whose expenditures exceeded income, the difference being made up by drawing on savings, by going into debt, or by accepting gifts.

Food—by far the largest item of expense of anthracite mine-workers' families, as of other wage-earners' families—cost the miner's household of six persons living in towns of 2,500 and over, approximately $71.00 per month in the winter months of 1922 and 1923. The foods purchased by 550 mine-workers' families did not conform in variety to the standards set by food experts as essential for healthful living. However, had the prices asked on December 15 in the anthracite region been applied to a standard winter diet for a mine-worker's family of six, such a diet would have cost $69.79 per month, or a sum approximately equal to the amount actually expended for food by the average anthracite mine-worker's family.

The purchase of clothing represented over one-seventh of the total family disbursements, or approximately $27.44 per month.

This is about $3.50 less per month than that which the National Industrial Conference Board budget allowed for a miner and his wife, one boy over 18 years and three children under 14 years of age.

Rent ranked third in importance in the expenditures. But it is not an expense universally borne, as are expenses for food, clothing and house furnishings. Outside of the company-owned patches, two-fifths of the families visited owned their homes, carrying in place of rent, fixed charges and other expense incidental to home ownership. Some of these houses were inherited from parents, but others have been purchased or are being purchased out of savings from earnings. In this region it is the ambition of thrifty families of all races to own their own homes. About one-eighth of the families visited had made payments on houses in the six months studied. These payments averaged $36.62 per family per month. Other families had been forced to forego payments due, because of lack of funds. Families paying rent in cities of 50,000 and over paid $14.71 per month, those in cities of 10,000 to 50,000 paid $14.39, whereas families in cities of 2,500 to 10,000 paid $11.36 per month. The rental in company-owned houses was always less. For the families included in this study it was $5.37 per month.

Because anthracite coal only is used for heating and cooking by the anthracite miner's family, the fuel bill is somewhat higher than in the bituminous fields, averaging $6.71 per month in the smaller towns and $7.30 in Scranton. Amounts paid to doctors are also much larger than in the bituminous fields, where a flat charge per month is made for mine company health service. Four-fifths of all the anthracite workers' families visited paid doctors' bills during the six winter months of 1922-1923, the average amount paid being $53.82. Church contributions, taxes, labor and the organization dues and insurance payments were also regular items in disbursements of the majority of families.

The careful study of disbursements made by the Commission indicates clearly that the prevailing standard of living among miners' families in the anthracite region is on a much higher level than in most of the bituminous fields. That this standard

permits of sufficient expenditure for food and clothing when measured with standards set up by experts is certain. But that the income of all anthracite mine-workers' families is not sufficient to enable all to reach the prevailing standard in their communities is also obvious.

A comparison of income and expenditures reveals the fact that 55 in every hundred families spent all their earnings on current needs; 20 in every hundred paid all current expenses and part or all of accrued debts; 16 in every hundred had money left after paying for current expenses to make investments or put in the savings bank. Only 9 in every hundred spent more than they earned. Although there were families which saved and families which went into debt in each income group, a study of the proportion of families which went into debt, broke even, paid accrued debts, saved or invested money in each income group, indicates clearly that families with incomes of less than $125.00 have a hard struggle to make ends meet; that families whose incomes range from $150.00 to $175.00 may break even, save or go into debt, depending upon individual thrift or circumstances. When the $175.00 income level is reached about half the people are enabled to put aside some money for future use, as well as to pay for current needs.

3. WAGE RATES

To understand the present rate structure it is necessary to consider the economic forces which have shaped the development of the anthracite industry during the second half of the last century. The unstable condition which characterized this period not only affected wage setting, but made a sound wage policy practically impossible.

First of the many factors influencing the determination of wage rates was the overdevelopment of the anthracite coal reserves. The productive capacity of anthracite mines had exceeded the normal needs of the country even before 1860. This condition was further accentuated by the abnormal demand and high prices

of the Civil War.[2] With the sharp decline in prices following the war there resulted a condition similar to that in the bituminous industry today. A measure of relief was sought by means of tonnage allocations, price agreements and concerted suspensions of work, but these efforts were all short-lived.[3]

A second factor affecting wage setting was the economic competition with the bituminous industry. Bituminous and anthracite coals were competing fuels, the large sizes in the manufacture of pig iron and the steam sizes in transportation and manufacturing industries in general.

Overdevelopment was further stimulated by the struggle between the larger coal-carrying railroads in their efforts to secure the ownership and control of coal mines and coal reserves.[4] A fourth factor which added to the demoralization of the industry was the conflict over freight rates between the independent coal producers and the railroad companies.[5]

These conditions were reflected in the labor relations of the industry. For over a decade prior to 1900 contract wages, day and hourly rates and conditions of employment were determined, not by collective bargaining, but by the "individual employee seeking employment pitted against the individual management." Under the conditions described above, it was inevitable that a haphazard development of the rate structure would follow and that innumerable differentials in the rates of pay for similar occupations would grow up within individual collieries, as well as between different collieries.[6]

Wages in 1901 and 1902. As a result of a strike of the mine-workers in 1900 a general increase of ten per cent was secured for all wage-earners in the anthracite region. This advance took

[2] Sydenstricker: Collective Bargaining in the Anthracite Coal Industry, United States Bureau of Labor Statistics Bulletin No. 191, p. 13.

[3] Cf. Roberts, The Anthracite Coal Industry, 1901, pp. 69, 175-80, 182-3; also Jones, The Anthracite Coal Combination, 1914, particularly p. 41.

[4] Cf. Walker: Development of the Anthracite Combination. American Academy of Political and Social Science, Jan. 1924; also Jones, op. cit.

[5] Sydenstricker, op. cit. pp. 70-72.

[6] Cf. United States Coal Commission, Wage Rates in the Anthracite Industry (mimeograph copy), pp. 22 to 28.

the form of an increase in the wages paid and a reduction in the price of powder. An analysis of the average rates of pay per 10-hour day for the 33,254 men and boys employed at the various collieries of six large railroad companies will give a fairly representative picture of the rate level prior to 1903.[7] Approximately 30 per cent received less than $1.30 per day; 56 per cent less than $1.70 per day and 91 per cent less than $2.10 per day.[8] This did not include contract miners who were piece workers. The Anthracite Coal Strike Commission, on the basis of statistics for the year 1901, found that the annual earnings of contract miners ranged from $550 to $600 and estimated the average annual earnings to be $560.[9]

Wage adjustments beginning with the award of 1903. In the spring of 1902 a general strike of the mine-workers, which continued for over five months, resulted in the appointment by President Roosevelt of the Anthracite Coal Strike Commission. Under the terms of its award of March 18, 1903, special provision was made for certain limited groups of employees, but the great bulk of the workers fell under one or the other of the following regulations regarding wage increases. The contract miners and their laborers, both of whom were piece workers, were given an increase of 10 per cent. The remaining employees, not specially provided for, were paid, on the basis of a 9-hour day, the same wages as were paid in April, 1902, for a 10-hour day, with proportional hourly rates for overtime.

The award supplemented these wage increases with a sliding scale of wages, based upon the wholesale price at New York harbor of prepared sizes of coal. Under this arrangement, all classes of mine-workers received, in addition to their daily earnings, a compensation which averaged 4.2 per cent for the period in which the sliding scale was in operation.

The award did not change the basis of wage payment or the

[7] These employees constituted about 22 per cent of the total wage earners in the industry.

[8] Cf. United States Coal Commission, Wage Rates in the Anthracite Industry (mimeograph copy), p. 9.

[9] Report of Anthracite Coal Strike Commission, 1903, pp. 177, 178.

working conditions under which coal was mined. No attempt was made to equalize wages or to remove inequalities. Hours of work were shortened, increases in wages were granted, but they applied equally to all workers of a given occupation. The intricate system of wage payment, together with the many rate differentials and inequalities—determined by individual bargaining under severe competitive conditions—were taken over by the Anthracite Commission and crystallized.

The rate adjustments of 1903 remained unchanged until 1912. On May 20 of that year a ten per cent increase over the rates established by the 1903 award was given to both tonnage men and company men.[10] However, this agreement abolished the sliding scale. In so far as this scale had netted an average gain of slightly more than four per cent, the actual increase secured by the readjustment was somewhat under six per cent. The 1912 rates were continued until 1916. The wage agreement of 1916 was to have remained in force until March 31, 1920. However, the rapid and unprecedented increase in the cost of living brought on by the war and the difficulty of maintaining an adequate force of mine-workers in the face of the higher wages that were being paid in other industries, made necessary revisions in wage rates in April, 1917, November, 1917, and November, 1918. Further increases were granted in April, 1920, and September, 1923. These rate revisions in every instance represented either actual increases in the rates paid or a curtailment of the length of the working day, plus an added compensation.

The provisions of the award of 1903 and the subsequent agreements relative to wage rates for the main occupational classifications have been summarized in table No. 60. The effects of this series of wage adjustments may be briefly compared in terms of the increase per dollar of earnings which they brought to the different classes of mine-workers.

Trend of contract miners' rates since 1902. For the contract

[10] The term "company men" refers to all workers paid by the hour, day, week or month. It does not include the contract miners and their laborers, who are paid on a piece rate basis.

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BREAKER BOYS

miners, assuming that they were able to send out as many cars of coal in the eight and nine hour day as they did in the ten hour day, the dollar of earnings of April, 1902, was increased by the award of 1903 to about $1.14; by the agreement of 1912 to $1.21 and by the agreement of 1916 to somewhat over $1.29. Subsequent readjustments increased the dollar of 1902 to approximately $1.43 in April, 1917; $1.62 in December, 1917; $1.81 in November, 1918; $2.14 in November, 1920, and $2.35 in September, 1923.[11] In this comparison, of course, no account is taken of changes in the purchasing power of money.

Trend of company men's rates since 1902. For the company men the effect of these increases is very different, according to whether their *hourly rates* or their *day's earnings* are considered. The effect on the *hourly rates* was to increase the dollar of 1902 to approximately $1.15 in 1903; $1.22 in 1912; and about $1.42 in 1916—a total increase of approximately 42 per cent as compared with the increase of 30 per cent for contract miners and their laborers. But this 42 per cent increase in the *hourly rate* of company men was not necessarily reflected in their actual earnings. The reduction in hours given them in 1902 and again in 1916 gave no actual increase in a *day's earnings,* so that the increase in earning power of company men from 1902 up to May, 1917, would have been only 13.3 per cent, if the mines had continued to work the same number of days as they worked in 1902 and 1903. There was, however, a considerable increase in the number of days worked per year as compared with the period prior to 1903. The number of days worked by all the anthracite mines in the five-year period ending in 1902 averaged 167 days per year, while in the five-year period prior to 1917 the average was 243 days. The economic conditions of the mine-workers had been bettered between 1902 and 1917 by this in-

[11] The average daily tonnage output per man in 1902 was 2.40 tons. Since that time it has ranged from 2.02 to 2.41 tons. However, because of many variables, the effect of which cannot be statistically measured, it is impossible to say just what the trend in average daily production per man employed has been since 1902. Cf. Mineral Resources of the United States, 1921—Part II, pp. 496-497.

TABLE 60

Wage increases secured by the United Mine Workers at anthracite collieries as the result of the 1903 award and subsequent agreements —1903 to 1923*

YEAR	CONTRACT MINERS	CONTRACT MINERS' LABORERS	INSIDE COMPANY MEN	OUTSIDE COMPANY MEN
1903 Award	10 per cent increase	10 per cent increase†	Same wages for 9-hour day as had been paid in April, 1902 for 10-hour day	
	Established *sliding scale* whereby all workers received 1 per cent increase in compensation for each increase of 5 cents in the average price of prepared sizes of coal at New York Harbor and vicinity above $4.50 per ton f.o.b.			
1912 Agreement	10 per cent increase	10 per cent increase	10 per cent increase	10 per cent increase
			Sliding scale abolished	
1916 Agreement	7 per cent increase	7 per cent increase	Same rate of pay for eight hours as had formerly been received for nine hours plus a 3 per cent increase	
1917 *April* agreement	10 per cent increase	10 per cent increase	36 cent per day increase to all company men who in 1916 had received $1.54 or more per day‡ 30 cent per day increase to all company men who in 1916 had received less than $1.54 per day	
1917 *November* agreement	25 per cent increase over rate of 1916	30 per cent increase over rate of 1916	$1.00 advance over 1916 rate to men who had received $1.54 or more per day in 1916 $.60 advance over 1916 rate to men who had received less than $1.54	90 cent advance over 1916 rate to men who had received $1.54 or more per day in 1916 60 cent advance over 1916 rate to men who had received less than $1.54

1918 *November* agreement	40 per cent increase over rate of 1916	40 per cent increase over rate of 1916	$2.00 advance over 1916 rate to men who had received $1.54 or more per day in 1916 $1.20 advance over 1916 rate to men who had received less than $1.54	$1.80 advance over 1916 rate to men who had received $1.54 or more per day in 1916 $1.20 advance over 1916 rate to men who had received less than $1.54
1920 *September* agreement	65 per cent increase over rate of 1916	Same as company laborers at the respective collieries	4 cent per hour increase to current rates for men who in 1916 received less than $1.545 per day 17 per cent increase to current rates for other company men—a 52½ cent per hour minimum rate established for workers who receive $1.545 or more in 1916	
1923 *September* agreement	10 per cent increase	10 per cent increase	10 per cent increase	10 per cent increase

* Includes only the large group of workers. The special provisions made in the case of limited classes of employees have been summarized in the Commission Study of Wage Rates, pp. 8 to 14 inclusive.

† Effective August, 1903.

‡ The 1916 rate referred to was the rate set by the Agreement of May 5, 1916.

crease in their opportunity to work more than it was by increases in rates.

Because of the different bases of increases granted since 1916 for the different groups of employees, it is not possible to continue the summary of the effects of wage increases upon the 1902 rates of the company men. However, reference to Table 60 will

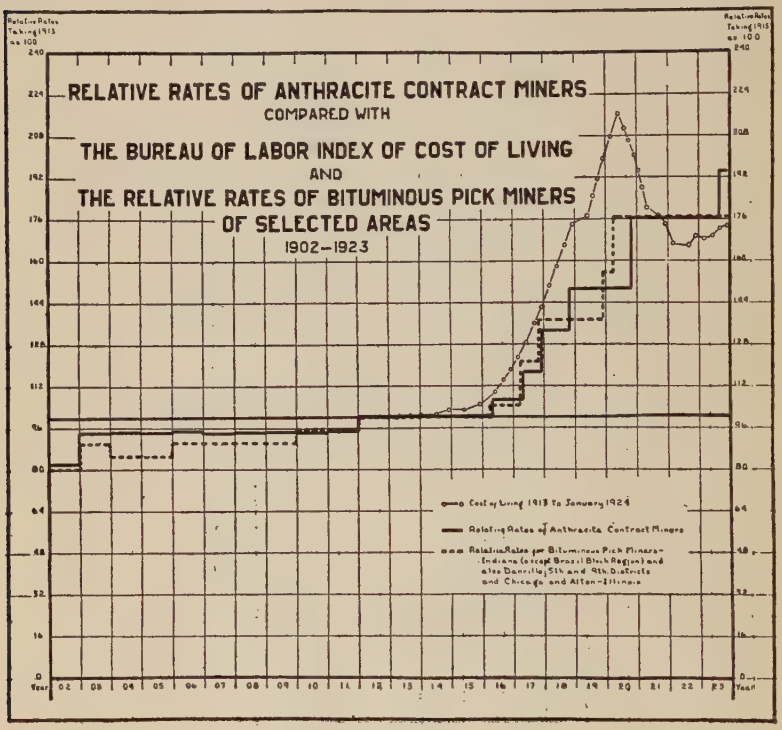
RELATIVE RATES OF ANTHRACITE CONTRACT MINERS
COMPARED WITH
THE BUREAU OF LABOR INDEX OF COST OF LIVING
AND
THE RELATIVE RATES OF BITUMINOUS PICK MINERS
OF SELECTED AREAS
1902–1923
Cost of Living 1913 to January 1924
Relative Rates of Anthracite Contract Miners
Relative Rates per Bituminous Pick Miner—
Indiana (except Brazil Block Region) and
also Danville 5th and 9th Districts
and Chicago and Alton—Illinois
Year

CHART 24

show that substantial advances were given in 1917, 1918, 1920 and 1923. Furthermore, there has been a lengthening of the working year, the average number of days worked per year for the six years beginning in 1916 being 274.[12]

[12] U. S. Coal Commission, Irregularity of Employment in the Coal Industry (mimeograph copy), p. 27.

Comparison of the trend of union rates and cost of living. Chart 24 has been prepared to make possible a comparison of the relative rates of contract miners with the Bureau of Labor's index of the cost of living and the relative rates of pick miners in selected bituminous coal fields.[18]

The rate of increase in hourly rates of company men has been much greater, but it cannot easily be shown in the diagram. The relation between increases in wages as reflected in labor cost and the price of coal at the mines as measured by the average sales realization is discussed on page 353.

Further examination of the chart will show that from 1913 until the second half of 1921 the cost of living had risen at a more rapid rate than did the wage rates of contract miners. Beginning with 1918 there was a considerable spread in the curves of living costs and relative rates, this being particularly pronounced at the peak of prices in June, 1920, when the relative difference was 66. Since 1921 the relative rates have been somewhat higher, especially after September, 1923.

Wage rates paid to company men under date of April 1, 1923. The actual rates in effect for company men during March, 1923, were secured for 53,159 company men from 180 collieries distributed through the three anthracite fields. Of these 24,087 were outside men and 29,072 inside men. Taking all of these wage-earners, irrespective of occupations, the hourly rates ranged from 23 cents to $1.11 an hour. The significant range, however, was from 27 to 71 cents, only one employee being reported as having received less than 27 cents and only 977 above 71 cents. Of the employees whose hourly rates were above 71 cents only 26 were being paid more than 89 cents.

These 53,158 workers may be classified into four major groups, as shown in table 61.

Thus, the great bulk of the employees, 88 per cent, received between 51 and 71 cents per hour. Of the workers receiving below

[18] In plotting the curves, the rates or prices in effect in the year 1913 were taken as the bases. For instance, the average price of anthracite coal at the mines was taken as 100 and average prices before and after that year were computed in terms of the 1913 price.

51 cents per hour 4,133, or 76.5 per cent, were boys, including about 3,000 slate pickers who worked in the breakers above ground and 800 door boys. Of the adult employees, therefore, approximately 95 per cent received hourly rates which ranged between 51 and 71 cents. As most of these employees were on an eight-hour day, their daily earnings fell between $4.08 and $5.68, unless overtime was required.

On further analysis of the rates of the 95 per cent of adult workers who fell in the 51 to 71 cent interval, it is found that 24.6 per cent received between 51 and 55 cents; 14.9 per cent between 55 and 59 cents; 33.8 per cent between 59 and 63 cents; 14.0 per cent between 63 and 67 cents, and 12.7 per cent between

TABLE 61

Number of company men classified by rate intervals

RATE INTERVAL	OUTSIDE EMPLOYEES	INSIDE EMPLOYEES	TOTAL EMPLOYEES	PER CENT OF TOTAL
27 cents and under 39 cents	4,092	921	5,013	9.4
39 cents and under 51 cents	286	106	392	0.7
51 cents and under 71 cents	19,193	27,583	46,776	88.0
71 cents and over	515	462	977	1.9
Total	24,086	29,072	53,158	100.0

67 and 71 cents. It should be noted that the wage agreement of September, 1923, gave a ten per cent increase to all wage-earners in the industry.

In the agreements up to 1917 the award of 1903 was taken as a basis for further adjustments and percentage increases were added to the rates in effect at the various collieries, thus further accentuating the inequalities.[14]

[14] The wage contract of May 20, 1912, stipulated that "all contract miners and laborers when working on consideration (time basis) shall be paid not less than the rate paid to company miners and laborers at the mine where the work is being performed." This provision, according to John Mitchell, had the effect of setting a minimum rate for these workers, and thus was a start towards uniformity in wage rates for contract miners on consideration. Cf. Final Report and Testimony of Commission of Industrial Relations. Vol. 1, p. 408.

In the three supplemental agreements beginning with April, 1917, and also the Agreement of 1920, which was based on the award of the Anthracite Coal Commission of that year, different flat increases were given to the day workers employed in the same occupations. By these contracts the higher-paid workers of given occupations were granted a larger flat increase than the lower-paid workers of the same occupations. This method of readjustment had the effect of further widening the range in rates. The contract of 1920 established a minimum hourly rate of 52½ cents, or a minimum daily rate of $4.20 for all employees who had received a daily rate of $1.545 or more in 1916. The result of this provision was to eliminate, in part, the lower range of differentials.

The United States Coal Commission found that, in the main, the haphazard rate structure of 1902, slightly modified by the rulings of the Board of Conciliation and the action of the mine committees, still exists. The following statement of the Commission will serve to illustrate the injustices that may arise:

> In one district company miners are now paid fifteen rates in 22 mines and in another district thirty-eight different rates in 65 mines, the hourly wage ranging from 59.4 cents to $1.02. Similarly in the same districts, an outside occupation, like carpenter, may have thirty-seven different rates in 22 collieries, with a range of from 52.5 cents to 72.7 cents an hour, while in the other districts the maximum rate for the same job is 90 cents and $1.00. Similar variations in wage rates for the same job are found throughout the anthracite region, the same mine paying five, six, or even seven different rates for outside laborers.
>
> Even with the piece workers or tonnage men, the contract miners and their laborers, the rates paid in different mines cannot be directly compared. In one mine, there is separate payment for each item of additional work, such as setting props and laying sheet iron, while in another mine in the same district, payment for these items is included in the car or ton rate for coal mined and loaded. These differences in tonnage rates may also involve marked inequalities inherited from the more or less haphazard arrangements of rates which prevailed twenty years and more ago. And the marked differences in annual earnings of these miners are in part traceable to differences in rates. In the same mine, miners working the full year range in earnings from $1,698.14 for 282 days to $6,414.64 for the same number of days. In another mine, a miner earned $4,471.88 in 283 days, while another, working 5 days more, earned $1,897.50. Or

stating it in another way, the same earnings for different miners in another mine may represent as much as 53 days' difference in working time. Obviously, any flat percentage increase in rates would only further widen the spread in earnings of men rendering similar service.[15]

4. VOLUME OF EMPLOYMENT

In the part of this volume dealing with the bituminous coal industry it was shown that the bituminous mines are operated for the most part on much less than a full-time basis. In anthracite collieries the situation is radically different.

Some twenty or more years ago, it must be remembered, the anthracite industry was considerably more irregular than the bituminous industry. From 1892 to 1902, inclusive (see p. 186, Chart 8), the anthracite collieries never averaged as much as 200 full-time days. The average for the decade 1892-1901 was only 179 days. But ever since the late nineties there has been a steady improvement in the regularity of anthracite operation, which has brought average days worked from its former position of 179 days to the much higher level of 273 days (in the six years 1916-1921). From as low as 59 per cent of a full-time year (which may be reckoned at 304 days in anthracite) it has risen to as much as 90 per cent. In 1921, 40 per cent of the collieries operated as many as 290 days, and in one war year, 1918, the average for all collieries was as high as 293 days.

While 90 per cent of full-time employment in the anthracite industry is far better than the 70 per cent level of the bituminous industry, still a situation in which the average loss of mine time amounts to more than one month out of twelve must be considered a source of substantial curtailment in the possible earnings of the miners.

Anthracite day men, like bituminous day men, tend to work longer than their mines. Considering overtime work, 54 per cent of the 17,000 day men studied worked as much as 300 eight-hour days. Only 21 per cent worked less than 270 eight-hour days,

[15] Special report of the U. S. Coal Commission to the President of the United States relative to the conference held with the representatives of anthracite operators and mine workers at New York, August 15, 1923.

while 16 per cent worked the equivalent of 370 eight-hour days. Among anthracite day men it would appear, therefore, that there is more over-employment than under-employment.

The absence rate among anthracite contract employees was found to be 11 per cent. In the tabulation of the anthracite data special steps were taken to prevent overtime work from counting as an offset against absence. The 11 per cent absence rate for anthracite mines should not be considered as in excess of the 10 per cent rate obtained for bituminous mines, where the method of tabulation did not permit of the same precautions.

5. EARNINGS

The study of earnings in the anthracite industry includes all men and boys engaged in the mining and preparation of coal at 216 operations in the year 1921. The concentration of anthracite in eastern Pennsylvania made necessary only three geographical subdivisions. The data covered 100 operations in the northern section known as the Wyoming district, 33 in the Central part, or Lehigh district, and 83 in the Schuylkill district. For purposes of summary the anthracite area may be regarded as a whole, with separation of the tonnage occupations in the above districts.

The piece-work occupations include contract miners, contract miners' laborers, with a few contract loaders or machine miners in each area.

Contract miners. Chart 25 shows in the lower segment the average starts made per man by contract and consideration miners to secure a given amount of earnings in each of the three districts. The black curve represents the average starts in all districts. The Wyoming curve follows the combined curve very closely. In the intervals between $1,000 and $2,000 the men in Schuylkill worked fewer starts than in the other regions. The Lehigh group worked the same or more days than the average in all intervals below $1,900; above $1,900 the curve is, in the main, lower than any of the other curves, thus showing, in the upper earnings intervals, fewer average days per man than any other area. The net result of this crossing and recrossing of the curves

may be summarized by comparing the approximate average earnings per start, which were $7.75 for the whole area, $7.50 for Wyoming, $8.00 for Lehigh and $7.95 for Schuylkill. On the whole, considering the grouping by earnings intervals, the similarity of earnings curves and consequently of earnings opportunity in the same average working time is striking.

Since the earnings figures are based upon the time worked at any one mine it seems best to state first the earnings in different working periods. The earnings of contract miners at 216 collieries in 1921 may be grouped as follows:

TABLE 62

TIME WORKED AT ANY ONE MINE	NUMBER OF MEN	APPROXIMATE EARNINGS PER MAN
1 and less than 50 starts	17,739	$130
50 and less than 100 starts	10,576	540
100 and less than 150 starts	5,055	880
150 and less than 200 starts	4,859	1,290
200 and less than 250 starts	10,165	1,810
250 and less than 300 starts	14,697	2,170
300 and over	461	2,735

The average annual earnings of all contract miners considered amounted to about $1,922. While this is an easily quotable figure it means little in terms of the actual range of earnings of miners. The following list of earnings taken from one mine indicates the differences in earnings within a range of *nine* starts. The table also shows the amount of time spent at other occupations.

In 273 starts one contract miner earned nearly $1,800, while at the extreme top of the range another earned nearly double in 274 starts. The figures quoted in the table are moderate in variation; in some cases a range as great as $1,400 to $6,000 could be given as earnings for the same number of starts. Whether the differences are due to skill, unusual diligence or favorable working places, the fact remains that no summary figure can be given which adequately measures the earnings of all contract miners.

Contract miners' laborers. The earnings of contract miners' laborers are more difficult to state than those of contract miners.

In the first place this is the occupation from which promotion is made to certified miners, consequently in the course of a year men who started as laborers may be transferred to contract miners. If the major part of the year's earnings were made after the transfer they would be classed as miners. This in itself would reduce the number of long-time men left in the occupation.

TABLE 63

EARNINGS GROUP	AMOUNT OF EARNINGS	STARTS MADE	REMARKS
$1,600–$1,700	$1,678.70	278	Transferred for 6 months as company laborer
1,700– 1,800	1,795.93	273	No transfer
1,900– 2,000	1,911.74	274	Transferred for 1 month as company laborer
	1,977.44	273	No transfer
2,100– 2,200	2,154.01	272	No transfer
2,200– 2,300	2,277.46	278	No transfer
	2,236.07	272	Transferred for 1 month as company laborer
2,400– 2,500	2,401.83	279	No transfer
	2,409.20	275	No transfer
	2,437.37	279	No transfer
	2,484.73	278	No transfer
2,500– 2,600	2,510.31	277	No transfer
	2,550.60	271	No transfer
2,600– 2,700	2,602.29	271	No transfer
	2,679.08	275	No transfer
3,100– 3,200	3,143.18	276	No transfer
3,500– 3,600	3,577.70	271	No transfer
	3,593.19	274	No transfer

Furthermore, the turnover for the occupation is high and also "new hirings" in the last part of the year were found to be high owing to increase in the total force.[16]

The upper segment of Chart 25 shows average starts of contract miners' laborers. It is apparent that miners' laborers in Wyoming had a considerable advantage over those in the other

[16] U. S. Coal Commission: Study of Irregularity of Employment in the Coal Industry, op. cit. (mimeograph copy), p. 42.

regions. The average starts for a given amount of earnings are highest in Lehigh. The spread of the curves shows that wages were not as closely balanced for laborers as for contract miners.

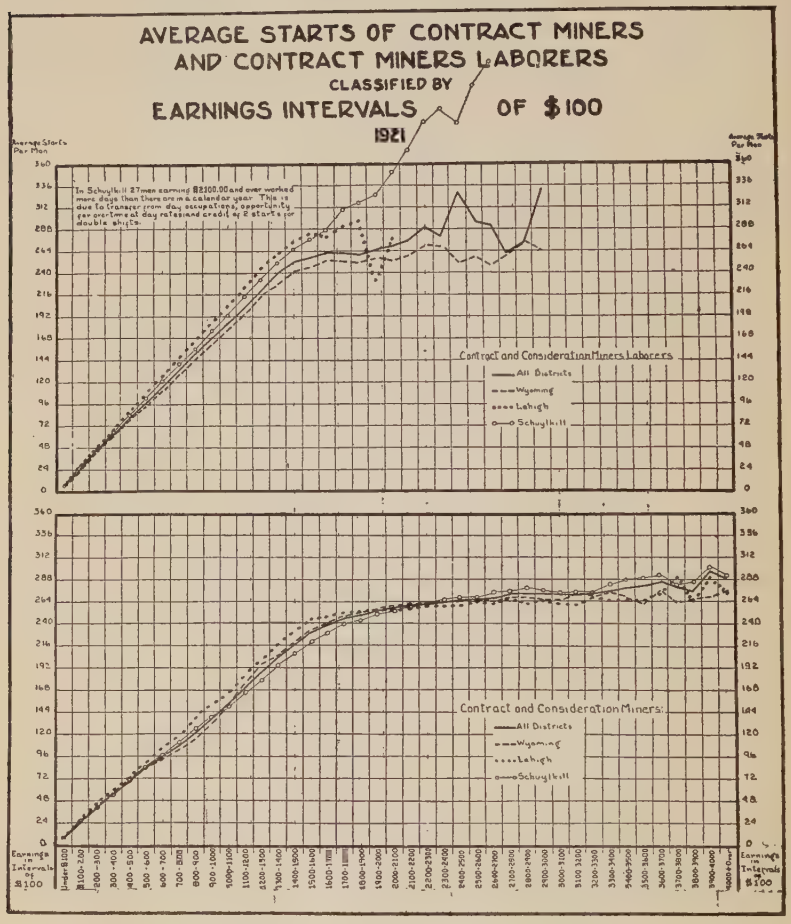

CHART 25

In the case of the miners' curve there is a moderately close adjustment in the earnings advantages of the three regions for the same working time. The differences in the three areas for miners'

laborers are shown by the approximate average earnings per start, which were $6.10 for Wyoming, $5.50 for Schuylkill and $5.25 for Lehigh. Combined for all districts the average earnings of miners' laborers were roughly $5.87.

The average earnings per man within a working period of 50 starts show that only about one-third of the contract miners' laborers remain on the payroll of one mine for 200 starts or over.

There is no way of making an adequate comparison between tonnage occupations in the anthracite and bituminous industries, since contract miners' laborers are lower paid than miners and would have to be considered in a comparison of tonnage groups

TABLE 64

TIME WORKED AT ANY ONE MINE	NUMBER OF MEN	APPROXIMATE EARNINGS PER MAN
1 and under 50 starts	49,370	$95
50 and under 100 starts	10,996	405
100 and under 150 starts	4,664	695
150 and under 200 starts	3,178	1,000
200 and under 250 starts	3,155	1,350
250 and under 300 starts	2,222	1,575
300 and over	175	1,865

in the two industries. Besides, whatever the average earnings per start, the regularity of operation in anthracite by contrast with the intermittency in bituminous gives the average anthracite tonnage worker an advantage in annual earnings. The average earnings per start in 1921 for contract miners—$7.75—were about the same as those of pick miners in Indiana and about 20 cents per start higher than for pick miners in the Pittsburgh area of Pennsylvania. By contrast the figure is about 83 cents per start lower than the average for loaders in Indiana, but about 23 cents above that of loaders in Ohio and nearly $1.00 above the daily earnings figure for loaders in the Pittsburgh area.

Inside day men. It is not practical to compare all the 19 inside day occupations separately tabulated in the detailed report. Four selected occupations are plotted on Chart 26 along with the curve for all inside occupations, excluding boys. The combined curve

includes occupations differing widely in skill. Timbermen are the most skilled and most highly paid of the inside day occupations. Company miners' earnings in the same time compared favorably with timbermen; the two curves ran parallel up to the $1,500

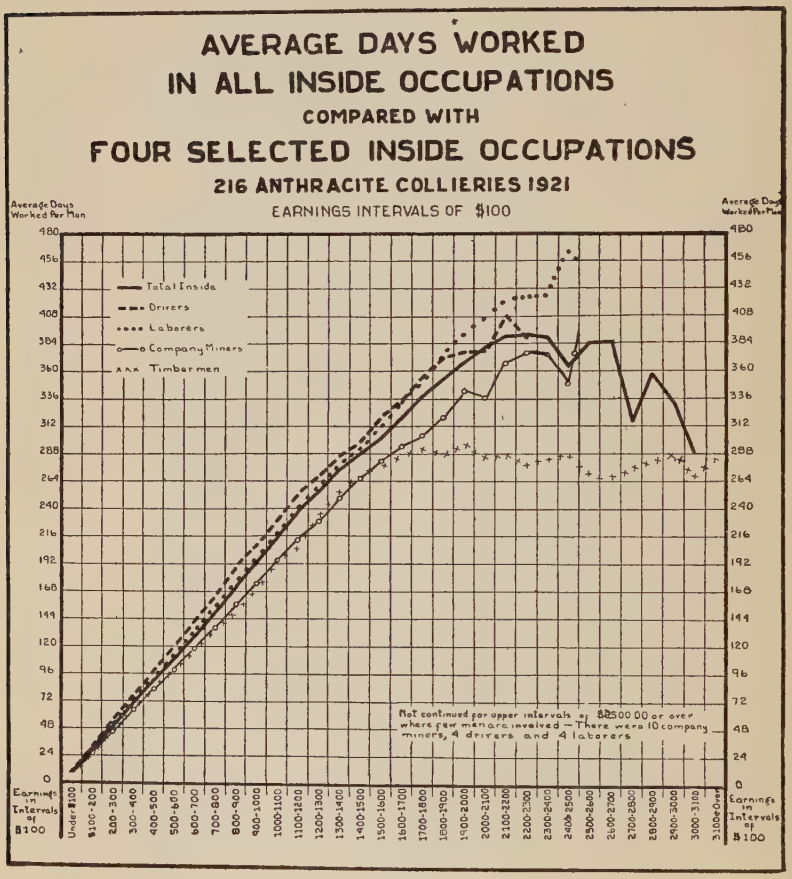

CHART 26

interval. Drivers and company laborers worked more starts than the average for all inside occupations.

As already explained, the figures of number of days worked by time workers or day men in this study are the total number of

TABLE 65

Approximate average earnings per man at any one mine during the year 1921 in the largest inside occupations in intervals varying by 50 days*

OCCUPATIONS	EARNINGS PER MAN IN INTERVALS VARYING BY 50 DAYS													
	Under 50 days		50 and under 100 days		100 and under 150 days		150 and under 200 days		200 and under 250 days		250 and under 300 days		300 days and over	
	Amount	Index†	Amount	Index†	Amount	Index†	Amount	Index†	Amount	Index†	Amount	Index†	Amount	Index†
Bratticemen and carpenters	$105	110.5	$395	117.9	$620	108.8	$875	108.0	$1,175	111.4	$1,425	110.5	$1,790	115.1
Drivers	95	100.0	335	100.0	570	100.0	810	100.0	1,055	100.0	1,290	100.0	1,555	100.0
Doortenders and patchers	75	78.9	225	67.2	380	66.7	540	66.7	710	67.3	890	69.0	1,140	73.3
Engineers	130	136.8	430	128.4	605	106.1	875	108.0	1,140	108.1	1,400	108.5	1,780	114.5
Headmen and footmen	110	115.8	355	106.0	575	100.9	825	101.9	1,100	104.3	1,335	103.5	1,725	110.9
Company laborers	100	105.3	360	107.5	595	104.4	855	105.6	1,115	105.7	1,345	104.3	1,665	107.1
Company miners	95	100.0	405	120.9	675	118.4	970	119.8	1,270	120.4	1,525	118.2	1,840	118.3
Pumpmen	115	121.1	375	111.9	605	106.1	885	109.3	1,090	103.3	1,430	110.9	1,875	120.6
Car runners	105	110.5	345	103.0	570	100.0	810	100.0	1,070	101.4	1,300	100.8	1,605	103.2
Timbermen	110	115.8	425	126.9	745	130.7	1,080	133.3	1,465	138.9	1,780	138.0	1,840	118.3
Tracklayers	110	115.8	395	117.9	615	107.9	890	109.9	1,175	111.4	1,430	110.9	1,800	115.8

* Amounts must not be assumed to be annual earnings. The figure cited is the average amount per man, earned while working at any one mine. Employees who shifted to other mines would be recounted.

† Index is based on drivers' earnings.

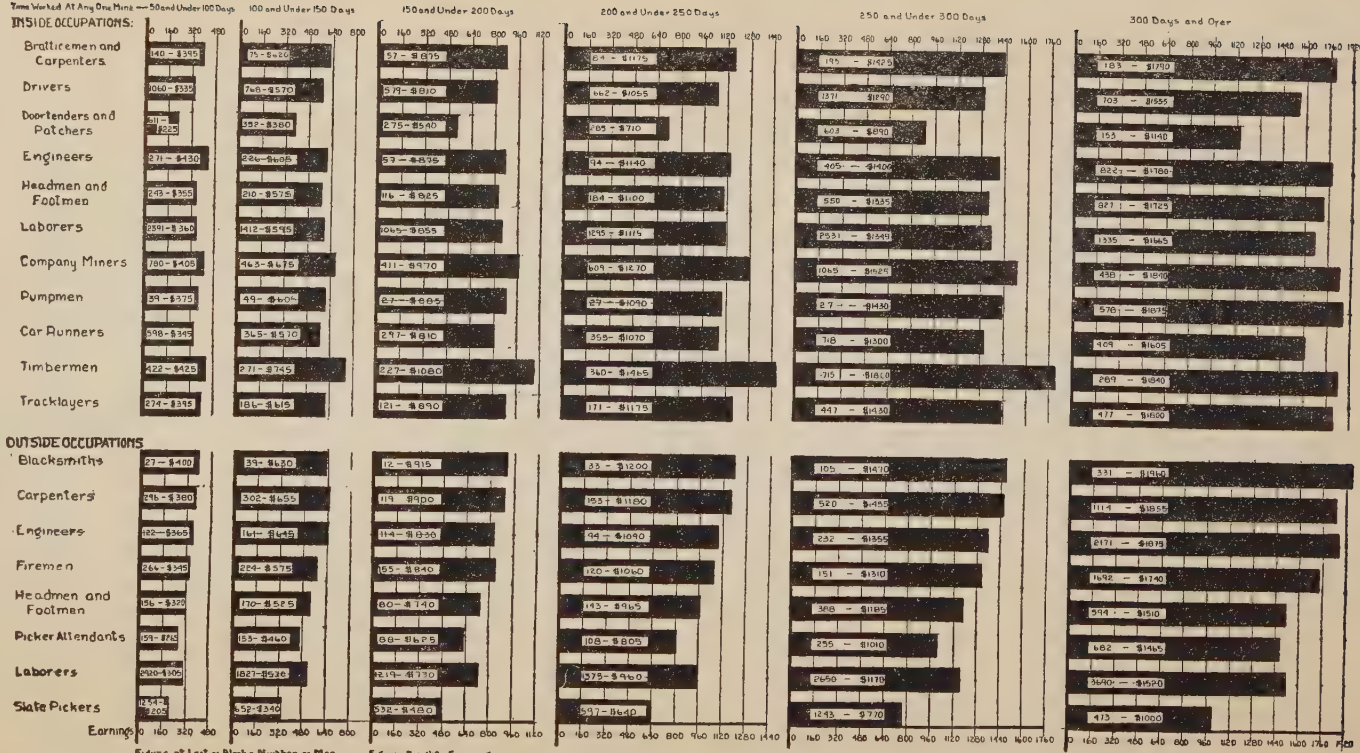

CHART 27. AVERAGE EARNINGS PER MAN AT ANY ONE MINE IN SELECTED INSIDE AND OUTSIDE OCCUPATIONS IN INTERVALS VARYING BY 50 DAYS, 216 ANTHRACITE COLLIERIES, 1921

hours worked reduced to equivalent eight-hour days. Where day men work overtime or where the established day is nine, ten or twelve hours, this method of computation may give a result in excess of 308 days, the normal full-time year of the mines, or even in excess of 365 days, when men work Sundays. These facts explain the appearance in the charts of men shown as working 400 days or more in the year.

TABLE 66

OCCUPATION	AVERAGE DAILY EARNINGS	INDEX BASED ON DRIVERS' RATE
Blacksmiths	$5.85	125
Bratticemen and carpenters	5.20	111
Drivers	4.70	100
Doortenders and patchers (boys)	3.20	68
Engineers	5.05	107
Headman and footmen	4.85	103
Laborers	4.90	104
Company miners	5.55	118
Masons	5.05	107
Pumpmen	5.10	109
Rockmen	5.60	119
Car runners	4.75	101
Shaft repairmen	5.55	118
Stablemen	4.75	101
Timbermen	6.20	132
Tracklayers	5.20	111
Miscellaneous (men)	5.00	106
Miscellaneous (boys)	3.75	80

The relative earning possibilities of the different occupations can be seen from table 65 by comparing the earnings of the large occupational groups within the same range of days. It is apparent, in the 250 to 300 day interval, that timbermen's earnings were highest, company miners next; pumpmen, tracklayers, bratticemen and carpenters follow in the order named.

In this time interval timbermen's earnings were 38 per cent higher than drivers, company miners 18.2 per cent higher, bratticemen and carpenters, tracklayers and pumpmen earned about the

same amounts and were nearly 11 per cent higher than drivers. The most important occupations are shown on Chart 27 for inside and outside groups.

The average daily earnings of inside day men are given to the nearest five cent interval in table 66.

TABLE 67

*Average earnings in specified anthracite occupations**

At rates in effect prior to the recent 10 per cent increase

INSIDE DAY MEN				OUTSIDE DAY MEN			
Occupation	Daily earnings	Days worked	Annual earnings	Occupation	Daily earnings	Days worked	Annual earnings
Drivers	$4.60	279	$1,280	Laborers	$4.25	311	$1,315
Car runners	4.70	277	1,305	Teamsters	4.40	327	1,435
Laborers	4.90	278	1,360	Stablemen	4.30	374	1,605
Masons	5.05	278	1,400	Firemen	4.75	344	1,635
Tracklayers	5.20	293	1,525	Carpenters	5.25	315	1,660
Engineers	5.05	308	1,555	Machinists	4.95	348	1,720
Timbermen	6.20	273	1,695	Engineers	5.00	351	1,750
Stablemen	4.75	360	1,705	Blacksmiths	5.30	330	1,755
Pumpmen	5.10	345	1,760				
All inside day men†	5.05	299	1,515	All outside day men	4.50	325	1,460

* In figuring average daily earnings as shown above, door boys among inside men, and slate pickers among outside men, have been excluded—in order that the averages might represent adult workers only. The average daily earnings here given were computed directly from the detailed tables published in the Coal Commission's Earnings of Anthracite Miners. . . . . For the sake of simplicity in presentation, daily earnings have been shifted to the nearest even five cents; and annual earnings to the nearest even five dollars. Neither set of figures is necessarily correct within that range, as it has been necessary to assume that all men working a given number of days, and earning between $1400 and $1500, earned $1450, and so on, for each group.

† Including occupations not given separately.

For purposes of comparison the earnings of the major occupations are compared with the figure for drivers. It will be seen that the relationship between the average daily earnings com-

pared closely with the proportion of earnings in the 250 to 300 day interval as given on table 65 for the largest occupational groups. While the earnings of occupations are compared for the same working period, it, of course, does not follow that the

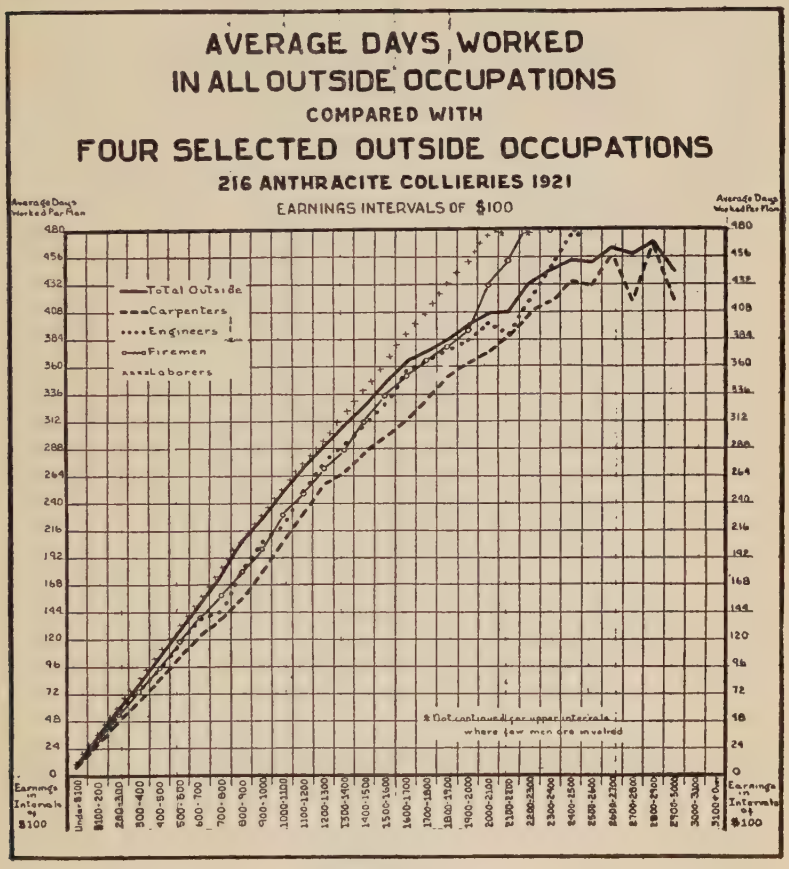

CHART 28

days of the various occupations were equally distributed within the period, nor does it follow that the average days worked by the different occupations, especially where the numbers are small, was the same. A shifting in the ratio of earnings between the occu-

TABLE 68

Approximate average earnings per man at any one mine during the year 1921 in the largest outside occupations in intervals varying by 50 days*

OCCUPATIONS	EARNINGS PER MAN IN INTERVALS VARYING BY 50 DAYS													
	Under 50 days		50 and under 100 days		100 and under 150 days		150 and under 200 days		200 and under 250 days		250 and under 300 days		300 days and over	
	Amount	Index†	Amount	Index†	Amount	Index†	Amount	Index†	Amount	Index†	Amount	Index†	Amount	Index†
Blacksmiths	$120	88.9	$400	105.3	$630	96.2	$915	101.7	$1,200	101.7	$1,470	101.0	$1,960	105.7
Carpenters	135	100.0	380	100.0	655	100.0	900	100.0	1,180	100.0	1,455	100.0	1,855	100.0
Engineers	115	85.2	365	96.1	645	98.5	830	92.2	1,090	92.4	1,355	93.1	1,875	101.1
Firemen	95	70.4	345	90.8	575	87.8	840	93.3	1,060	89.8	1,310	90.0	1,740	93.8
Headmen and footmen	105	77.8	320	84.2	525	80.2	740	82.2	965	81.8	1,185	81.4	1,510	81.4
Picker attendants	95	70.4	265	69.7	460	70.2	625	69.4	805	68.2	1,010	69.4	1,465	79.0
Laborers	95	70.4	305	80.3	520	79.4	730	81.1	960	81.4	1,170	80.4	1,520	81.9
Slate pickers	70	51.9	205	53.9	340	51.9	480	53.3	640	54.2	770	52.9	1,000	53.9

* Amounts must not be assumed to be annual earnings. The figure cited is the average amount per man, earned while working at any one mine. Employees who shifted to other mines would be recounted.

† Index is based on drivers' earnings.

pations in the 300-day and over group may be accounted for by differences in overtime between the occupations. Dr. Drury has fortunately been able to supplement the anthracite data by a computation of average days worked, upon which he has computed an approximate annual earnings figure for some of the major inside and outside occupations. His figure corresponds markedly with the comparisons given above for the various occupations in the same working period and are, therefore, quoted from the Annals, January, 1924. (See table 67.)

TABLE 69

OCCUPATION	AVERAGE DAILY EARNINGS	INDEX BASED ON DRIVERS' RATE
Blacksmiths	$5.35	102
Carpenters	5.25	100
Engineers	5.00	95
Firemen	4.75	91
Headmen and footmen	4.30	82
Picker attendants	3.85	73
Laborers	4.25	81
Loaders of railroad cars	4.25	81
Machinists	4.95	94
Pumpmen	4.55	87
Stablemen	4.30	82
Slate pickers	2.85	54
Teamsters	4.40	84
Timber cutters	4.45	85
Tracklayers	4.50	86
Miscellaneous (men)	4.40	84
Miscellaneous (boys)	3.10	59

Outside day occupations. The outside day occupations are especially important in anthracite owing to the large number of men and boys employed in and about the breaker. The boy occupations were excluded from the curve on Chart 28. Carpenters, engineers, firemen and laborers are the largest occupations employing men. Of these occupations carpenters made the highest earnings, with engineers next.

By time worked the approximate earnings per man are shown in table 68 preceding.

The average daily earnings given to the nearest five cent interval are shown for all outside occupations in table 69.

This is supplemented by the calculation of Dr. Drury for annual earnings. Comparisons between anthracite and bituminous should not be made for all inside and outside day men. The outside anthracite group is heavily weighted by breaker employees, the inside by company miners, occupations which have no parallel in the bituminous industry.

CHAPTER XI

Labor Relations in Anthracite Mining

In Chapter I it was pointed out that the external conditions in the anthracite region are favorable to the negotiation of wage agreements and their successful execution. Unlike the bituminous industry, the wage contract is binding upon the whole of the anthracite industry. Hence the problem of negotiating new agreements without stoppage of work and administering the agreements when made are of primary importance. The rights and responsibilities of the public, as well as the rights and duties of the anthracite operators and the United Mine Workers of America, are also to be considered and defined.

General findings. The agreement between operators and the union, which has been in effect since 1903, is widely accepted in principle by both sides, but is carried out in performance very inadequately. There are strikes in violation of the agreement. There are delays in the consideration of disputes which form a serious handicap to satisfactory working; there is not enough specialized provision for consideration of specific disputes right on the ground and at the mine where such disputes arise, and in the handling by employers of the early states of disputes there is too great a disparity of practice and point of view.

Joint Administration. The union has so arranged its organization that the district representatives participate in the handling of the union dispute cases. There is no association of employers to make easy the attainment of a similar unity on their side in the early stages of disputes. Consistency of practice at the point where disputes arise has been found essential in most industries where experience in working under an agreement has been had. But in anthracite mining the union virtually deals separately with each company up to the time of appeal to the Board to the disadvantage of the employers and of the whole joint structure.

It was recommended by the Commission that the next agreement plan for the following:

1. A continuing Umpire or an assistant to him who should sit with the Conciliation Board at all its meetings.
2. The operators should elect for each of their three (3) members of the Conciliation Board an alternate (or alternates) who should be a man (or men) of like standing in the industry and who should have authority to act in the absence of the member.
3. The operators should appoint a full-time representative with adequate assistants, who jointly with the district officers of the union should consider at the mine each case which is to be appealed to the Conciliation Board, so that one more possibility may be offered for local settlement by mutual consent, and so that the cases before the Board may have thorough and unified presentation from the operators' side. Upon him would be placed the responsibility of developing among the mine companies and their executives, especially mine superintendents and foremen, a sound and consistent approach to the labor problem.
4. The parties to the agreement should provide for a committee to work out a restatement of the whole agreement in terms that the two parties would agree to abide by today. Such a statement would be in the nature of a code for the anthracite industry.
5. If the facts in a case are not clearly and definitely presented to the Board of Conciliation, it should be the duty of the Board to appoint one or more examiners immediately to investigate and furnish it with such facts.
6. A case submitted to the Board should be decided or referred to the Umpire within thirty (30) days, or should be continued by joint agreement of the parties to the case.
7. There should be included suitable clauses for penalties in case of violation, the general nature of these penalties to be worked out by the parties to the agreement and stated in the agreement.

Wage rates and restriction of output. Many elements affecting the miners' difficulties in mining anthracite coal vary so widely that a "day's work" and, therefore, the appropriate rates per ton, per car or per yard are markedly dissimilar among the various working faces. These variations are now met by allowances and considerations, which, however, use the conditions of 1902 as a base from which to figure. This base was, of course, the cumulative result of trading under widely varying conditions of mining and of trading strength, and the physical circumstances of 1902

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THE UNION BUTTON

have in many cases altered completely; yet there would be nothing but harm arise from attempting to correct the 1902 base by further trading alone. It is manifest that owing to these causes there are many inequities among the rates of the employees of the anthracite district, which will arouse more and more irritation as years go on. To obtain a scientific basis upon which to fix such rates will require months if not years of study and examination. It is, therefore, essential that the parties to the agreement take up the subject, and it was recommended by the Commission that:

8. The next agreement should provide for a joint commission to inaugurate a careful study of the elements of the jobs in the anthracite industry, for the purpose of building up a scientific and more equitable basis for rate making. Pending results of such study it will be necessary, of course, to retain the old 1903 base.

Too much is said and too little known about a "day's work" for a miner. It varies with the physiology and mental attitude of the worker, with his rate of speed and his skill, with geology and with skill in management. Overwork is always a possibility. Where a miner sets his own limits to his "day's work" he is unavoidably influenced by his ideas of a satisfactory level of income and by his fears of the adverse effects that may result from records of high earnings. Not a little restriction of output arises under such circumstances. Its only cure is an analysis of the elements of the job.

Hours. It is reasonable to believe that the sense of unfairness among the relatively few men working ten to twelve hours per day, or thereabouts, kept alive irritations which cost more than whatever might be the saving, if any, from the longer hours. It was therefore recommended that:

9. Provision should be made in the next agreement for the elimination of the long day.

This was done.

Discharge and discipline. For good management there must exist power of discipline and discharge, safeguarded only against

the abuses of precipitancy, capriciousness and the like. These powers today are abridged scarcely at all by the agreement, but are materially abridged by attitudes which have grown up in spite of it. It was recommended, therefore, that:

10. The new agreement should correct the present discrepancy between principle and practice by stating specifically the rights and obligations of both parties. In our judgment the right of discharge and discipline should rest with the operator, subject to appeal and prompt review by the conciliation machinery in case the discipline is alleged to have been unreasonable or unjust. Obviously both parties must be committed to abide faithfully by the results of such review.

Union responsibility. The union has passed its days of struggling for existence and has reached the stage of constructive opportunity in which it must justify itself by a new kind of service. The time for purely restrictive exercise of power is past. With the power already achieved the union has the opportunity and the obligation to help in working out whatever measures are necessary for effective discipline and management in the industry. To cite a single example, reasonable provision for registering the time of arrival and departure of employees is an incident to proper administration to which both parties should subscribe and which both should help to make effective.

The union also stands in a relation to its own members which implies a service beyond the mere activity of grievance and strike committees. If the union is wise it will not permit the employer to take over the duty of securing members, thus shutting it off from a responsibility and a contact with the rank and file that in the long-run must be the source of its vitality. By close, continuous and effective educational contact it must steadily build up the calibre of all its leaders and greatly increase attendance at its meetings. Habitual resort to petty strikes means sacrificing a real authority, based upon recognition of work, for a temporary authority, based on force and threats of force which, the nation will sooner or later be obliged to curb. The national union must daily serve the anthracite industry or expect dissension and secessions. The district organization must afford a control which

enforces the agreement, or expect the public to provide an enforcement more mechanical, less expert and less sympathetic.

Threats of outlaw strikes are wholly to be condemned, and the one best organization to put a stop to them is the union, for people do not often work well together after the law has once stepped in between them. Nevertheless, when the union, in the eyes of the people, has had the chance and failed, there will be almost no escape from resort to legal methods.

Operator responsibility. But the operators have similar obligations and opportunities. The operators may aid in making the public resort to legal methods unnecessary. They are in a position to harvest the experience in their own and in other industries, and, in the light of that experience, to concentrate dispassionately on the best methods of adjusting practice to the real psychology of men at work. In the systematic cultivation of their relations with their own employees, in the selection and development of leaders of men as foremen, in continuing the education of men in management, and in organized efforts to build internal good will, the operators have an opportunity to strengthen all normal motives toward co-operation and thus to weaken the forces making for strife. The dominance in the anthracite fields of the large company, with all its chance for *concentration of responsibility for labor relations upon some high official,* offers every opportunity and hope, if the will be there.

Primarily, it is the growth of a better spirit and a better partnership which the industry needs, and there is no hope of encouraging such a growth by punitive legislation. The foregoing suggestions for changes in administration on both sides have not been given too hard and fast a form. The men of the industry should know the precise form which measures necessary to progress should take. Both parties, however, must lay stress upon the fact that the American people will expect much.

The national strike and the Government's relation to labor relations. It has been made plain in other chapters of this book that national strikes have been in almost all cases the cause of shortages and high prices of coal, and that the problem of an adequate supply hinges on minimizing national strikes. The method most

frequently recommended to the Commission for the minimizing of such strikes was *compulsory arbitration.* This method was suggested not only by the operators' briefs, but by many persons not connected with the industry or union. It will be remembered, also, that the union, under the leadership of John Mitchell, in 1902 plead fervently with President Roosevelt for recognition of the principle of arbitration which, as a weak and struggling organization, it argued was fair and just. The reversal of position on this subject on the part of both operators and miners is primarily due to the shift in relative strength that has occurred since 1902. These facts, however, as well as the logic of our judicial system in commercial affairs and the dictatorial attitude at times assumed by the one or the other party, would seem to offer a strong theoretical case in favor of compulsory arbitration in the coal industry as a means of protecting the public interest. Why, then, did the Commission not recommend compulsory arbitration? Its position on this subject and the related subject of compulsory incorporation of unions was stated in the following words:

> We do not advocate nationalization as a means of meeting the national strike or other parts of the problem of labor relations.
>
> We recommend against compulsory arbitration as a means of preventing a national strike, because we do not believe in discretion-made law in either the industrial or political field, and because there is no way to enforce a compulsory award which does not involve enforced operation or enforced labor.
>
> We believe that incorporation of the unions would not have the effect of binding the union to its contracts, and making it responsible, often predicted for it. Contracts can now be made if both parties wish, with effective binding power, but ordinarily neither side desires that wage contracts shall be specific enough to be legally binding through judicial enforcement. The flexibility of various state incorporation laws makes it unlikely that incorporated unions would differ practically from unincorporated. Finally the Coronado case not only decides that a union is a legal entity for the purpose of responsibility for torts, but also holds that a union voting a strike renders itself responsible for acts growing out of the strike just as a corporation would be responsible for the acts of its officers and that the union funds can be reached directly through a suit for damages, just as the property of a corporation can be.

The brevity of this statement makes the Commission's position clear, but leaves much of the reasoning back of that position to be imagined. Such considerations as those which follow may have led to the Commission's position on compulsory arbitration.

The economic and psychological problems involved in labor relations cannot be solved by legislative enactment or judicial fiat. The decree of a compulsory arbitration tribunal might possibly succeed in preventing official strikes, even though the experience with compulsory arbitration tribunals makes even that doubtful. It would, however, substitute unofficial, uncontrolled, outlaw strikes with no one responsible, for "official" strikes conducted by a leadership in whom responsibility is in some degree centered. It is the experience in unionized industries that there is a better chance for orderly procedure and industrial peace and co-operation if responsible leadership is fostered rather than shorn of whatever responsibility and control it may have. Only through leadership may the actions of the organized rank and file be controlled unless we are willing to resort to measures which seek to compel men to labor, a practice which would lead only to chaos.

The Supreme Court, in a decision affecting the Kansas Industrial Court, has at least raised the question whether compulsory fixing of wages, compulsory continuity of operation and compulsory continuance of employment by workers would be legal.

But these objections, though important, are secondary. Freedom from strikes cannot be obtained by compulsion. It can grow only out of good relations, a solution of the economic problems which cause strikes, and on the part of both parties co-operating in making the collective bargaining arrangements serve the public as well as themselves. Policies to be successful must have the support of both parties. The best relations in industry cannot be obtained by the compulsory pronouncements of a third party, even though that body be a Government labor board, any more than can the best domestic relations be obtained by the continuous intervention of a court of domestic relations. The wiser and more fundamental policy, even if it lacks the appearance of mechanical simplicity, is to stimulate both operators and union to such an attitude and to such an attack upon their own problems that both

sides will realize the shortsightedness of policies which lead to a settlement of differences by a fight at the expense of the public.

These objections to compulsory arbitration do not mean that the Commission was opposed to voluntary arbitration in cases of dispute; on the contrary, it specifically approved the practice as applied to the disputes arising during the life of the agreement.

In the encouragement and assistance of this constructive policy of labor relations, the Government can and should assist by

(a) continuous investigation and publicity so that all facts may be known and relations shall go forward in the light of public knowledge;

(b) research and study into such fundamental problems of the industry as unemployment and rate differentials, and

(c) mediation.

The Commission discussed these duties of the Government as follows:

> Half-information on topics of mutual concern ranks high among the factors that tend to mar relations. We, therefore, recommend a policy of publicity of facts—both within the individual mine and nationally—which would include accounting reports by operators as recommended in the Commission's anthracite report and similar reports concerning union finances.
>
> We recommend that the Congress provide for the continuing co-operative study of and action against the problem of unemployment as one of its first responsibilities. This would involve studies and activities in the fields of labor relations, technical aspects of production, and the marketing and storage of the product.
>
> We recommend continuing co-operative study by the Federal government of the principal jobs and of the existing rate differentials. It is important to develop an adequate basis for the needed revision of the rate structure at present marked by many inequalities between sections, between mines, and between jobs in the same mine.
>
> We recommend continuous investigation and publicity by the Federal government of the basic facts upon which industrial relations depend. Such continuous investigation should not be principally critical, in the sense of being chiefly concerned with noting cases of bad practice, but rather with making known cases of the opposite sort. This should bring about such a continuous interchange of information as to stimulate a greater sense of public responsibility and better practices by the union and the operators.

We recommend special compulsory investigation when the prospect of failure to renew an agreement is imminent, so that the public may have a chance to be heard before conflicts arise. Specifically, we recommend an inquiry under the authority of the President of the United States. To this end, it is suggested that all agreements should contain a clause that will provide for automatic renewal of all agreements except in regard to provisions concerning which either party may have given notice to the other ninety days in advance of the date of termination of the agreement. In case of failure to agree, a report, setting forth the factors at issue, should be made to the President, by each side, not later than sixty days before the expiration of the agreement. It is recommended that when such a report is made, the President immediately inquire into the factors at issue and secure a report and award thereon made on or before the date of expiration of the agreement. The award would or would not be made public as the President would deem wise in the particular circumstances. It should be the purpose of such a report to focus upon the negotiators the irresistible moral pressure implicit in their joint obligation to furnish the public with coal.

We are confident that with a continuous orderly process of investigation and report, and, if advisable, with the timely injection of a definite representative of the public into the situation in case of disagreement, it will become very much more difficult for either side to adhere in any captious way to a contention that will precipitate a tie-up of the industry.

In case a suspension occurs because of failure to reach an agreement before the expiration of an existing contract, there should be no question of the continuance of maintenance men at their occupations. Both in the interest of the industry and in that of the public every contract should provide for this contingency.

The best approach to a remedy for the evils of the general strike will not, in our judgment, be found in an immediate resort to drastic prohibitory measures. Whatever artificial gap may have developed between employer and employee, they must work together or there can be no peace and no real efficiency. The weight of opinion among operators and union officials alike is that they themselves desire to fix the fundamental terms upon which the industry shall operate. The most thoughtful and best advised among them express great confidence of their ability to do this in an orderly way. From our survey of the statesmanship that exists in the industry, it is believed that the operators and the union are equal to this task, if once they recognize the finality of the public insistence on continuous operation and address themselves single-mindedly to bring that object to pass. It will be necessary, however, for them to find means of bringing their best statesmanship to the front in connection with the general negotiations. They cannot perform this indispensable public duty

unless they emancipate themselves from the atmosphere of militancy that too often characterizes their proceedings.

It is believed that the combination of continuous investigation and publicity with the possible resort to mediation at the instance of the President of the United States, may remove the necessity for more drastic emergency measures. The process here outlined should have a sobering influence that will make strongly for enforcing responsibility to the public among representatives of both the operators and the miners. Until measures for holding both sides to their responsibilities have been exhausted, it will be extremely unwise for the public to embark on coercive measures of regulation of labor relations.

While it is believed that the above suggestions will encourage mutual accommodation and agreement at the time of the renewal of negotiations and will therefore lessen the chances of national strikes or suspensions, the fundamentally constructive opportunity lies in the building up of the day-to-day relations within the agreement period. Improvement in industrial relations during the life of the agreement would very considerably lessen the probability of a national strike. . . .

Peace with justice in the industry is the first requisite and economy is the second.

CHAPTER XII

The Limited Supply of Anthracite; Possible Substitutes

The production of anthracite is liable to sudden interruption by strikes in much the same way as bituminous coal, but even when no crisis threatens there exists a problem in adjusting the limited supply of this much-prized fuel to the needs of an expanding population. For the past ten years there has been practically no increase in the production of the domestic sizes suitable for household use, although the population of the anthracite consuming territory has steadily increased.

Chapter XII deals with the physical limitations on the supply of domestic anthracite and with the possibility of supplementing that supply with other domestic fuels. It is not concerned with the business policy of the producers, which is discussed in Chapter XIV.

The capacity of the anthracite mines. The present physical capacity of the anthracite mines is dependent upon labor supply, mine development, breaker capacity and coal reserves. Granted plenty of labor, mine development can easily be obtained. It need not, therefore, be separately considered.

In 1914 there were employed in the production of anthracite, 179,679 men and boys. This was the maximum number ever attained and was reflected in a total capacity of mines, washeries and dredges of 115,000,000 net tons. Between 1905 and 1915 the number of employees was over 160,000, a maximum capacity of 128,000,000 tons being reached in 1908, employees then numbering nearly 175,000. In 1920 there were 144,748 employees, with an estimated capacity of 102,000,000 and an actual production of 89,598,000 net tons. Capacity closely follows increases and decreases in average number of employees. Chart 29 illustrates graphically, production, number of employees and capacity, from 1890 to 1921, capacity being estimated on the basis of a 308 day working year.

A survey of breaker and other mine facilities at collieries, with immediately available coal acreage, indicates an apparent capacity to handle the output of some 193,000 men, 13,000 more than were ever employed in any one year and 48,000 more than were

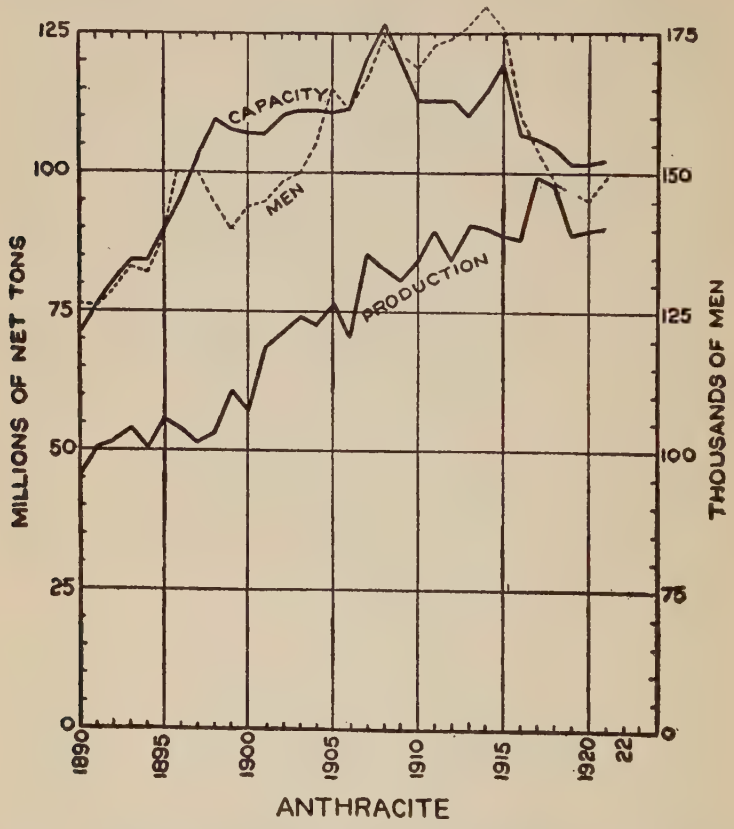

Chart 29. Production, Number of Employees, and Capacity of Anthracite Mines, 1890–1921, Capacity Being Estimated on Basis of a Working Year of 308 Days

working in 1920. These men could have added 30,000,000 net tons to the 1920 production, making a total of almost 120,000,000 tons, assuming that the market would have absorbed this increase. It is, therefore, apparent that the physical factor limiting produc-

tion is shortage of labor. From the incomplete evidence available it appears that this shortage is principally one of miners' laborers, who were formerly recruited extensively from the ranks of European immigrants. Restriction of immigration has curtailed this supply and apparently it is very difficult to secure American-born men for this work.

The Commission, in its report on the anthracite industry, stated that:

> The observations of the engineers are . . . to the effect that the present deficit in labor is a shortage of miners' laborers rather than of miners themselves, so that the present limitation of capacity cannot be charged to the Pennsylvania requirement of certification of miners.[1] . . .

The Commission concluded that:

> . . . at present the supply of unskilled laborers is the immediate limiting factor in anthracite production. . . . This has been the condition since 1916. It may not be described, however, as a physical limitation over which the operators have no control. Other industries employing similar labor have increased the working forces during this period, notably the bituminous mining industry, to an excessive degree. It therefore appears that earnings and conditions of labor offered by the anthracite industry viewed in the aggregate have not attracted labor in the same degree as have the wages and conditions offered by other industries.[2]

Labor supply thus sets the immediate limit to *capacity*. *Production* practically reached this limit of capacity in 1918, when the collieries operated an average of 293 days. Since the war they have been running about 270 days, except, of course, during the strike year 1922. The figures, as reported by the companies to the Geological Survey, have been as follows:

1918.....	293	1921.....	271
1919.....	266	1922.....	151 (Strike year)
1920.....	271	1923.....	268

Omitting the war years 1917 and 1918 there have been no acute shortages of anthracite except those caused by strikes. The

[1] United States Coal Commission, Report on the Anthracite Coal Industry (mimeograph copy), p. 39.

[2] Ibid., p. 40.

best production records available are those compiled by the United States Geological Survey. Table 70 has been abstracted

TABLE 70

Production of anthracite mines, dredges and washeries

YEAR	PRODUCTION
1807 to 1820	12,000
1830	215,272
1840	967,108
1850	4,138,164
1860	8,115,842
1870	15,664,275
1880	28,649,812
1890	46,468,641
1900*	57,367,915
1901	67,471,667
1902*	41,373,595
1903	74,607,068
1904	73,156,709
1905	77,659,850
1906*	71,282,411
1907	85,604,312
1908	83,268,754
1909	81,070,359
1910	84,485,236
1911	90,464,067
1912*	84,361,598
1913	91,524,922
1914	90,821,507
1915	88,995,061
1916	87,578,493
1917†	99,611,811
1918†	98,826,084
1919	88,092,201
1920	89,598,249
1921	90,473,451
1922*	54,683,022

* Strike years.

† Years of very large washery production.

from these records and shows the annual production at ten-year intervals from the earliest records to 1900, and for every year

thereafter to and including 1922. In the latter part of this table certain years mark the termination and renewal of contract between mine-workers and operators, 1900, 1902, 1906, 1912 and 1922 illustrating clearly the effect of general suspensions of work upon production.

Preparation. Anthracite is generally marketed in seven different sizes. Efforts have been frequently made to reduce the number of sizes by one, two or three grades. Some operators have reduced their number of sizes with varying results. Others have been prevented from doing so by the more diversified demand of a wider market.

Multiplicity of sizes adds to the burden of cost in preparation, transportation and distribution. Simplification of sizes seems desirable, but cannot be obtained without the unqualified co-operation and unified action of dealers and producers.

Considerably more is involved in the preparation of anthracite than mere sizing. The coal as mined contains foreign matter approaching 50 per cent of the total volume in the southern end of the anthracite region. This consists of rock, slate and bone coal. Its separation demands the construction of huge preparation plants, known as breakers, constituting the major portion of the cost of a complete mining plant or colliery.

In the breakers the larger pieces of rock are separated by hand and the smaller particles by one of a number of standard processes. The coal is crushed and screened to standard sizes and at the large majority of mines cleaned to a well-defined standard of purity, practically no "fireproof" coal coming from any of the regularly established producers.

Waste. There are several sources of waste in these breakers. One, an absolute waste, is the coal carried away with the impurities in the process of cleaning. The other is the coal smaller than steam sizes, which is washed away or carried in suspension by the water used in cleaning the coal. Together they constitute a serious loss. At many collieries this fine coal is removed from the breaker water by a thickening or sedimentation process, thus saving it for the future when its use will have been made more practical.

The major waste in anthracite production occurs underground (i. e., in the mine). This waste is at its minimum in the moderate sized and comparatively regular and level-lying seams of the northern fields and attains the maximum in a large, heavy-pitching and highly-disturbed seams of the southern field. It is expected that the future will show further improvement in mining which will materially decrease the present losses.

The overall loss in mining may be still further reduced through recovery and utilization of the fine sizes, now either wasted or held for future use. Tests indicate the practicability of ultimate recovery and cleaning of these fine sizes—in some instances to 1/200 of an inch, in others only to 1/50, the practical limit varying with the percentage of ash or impurities held in suspension with the coal.

Concentration tables, hydraulic classifiers and thickeners are being installed, their use at many collieries having definitely passed the experimental stage. One operator has found a market for carefully-cleaned coal running about 1/16 to 1/40 inch in size. Another is reducing these fine sizes to dust and burning them in suspension with very good results. A third is converting them into briquets. Still another has made good domestic fuel by mixing these small sizes with bituminous slack and coking and crushing to convenient size.

Not only may improvement be expected in the use of these fine sizes, but recent developments in combustion practice warrant a belief that the larger steam sizes will soon be extensively used as domestic fuels. Furnaces now exist which will readily burn buckwheat and rice coal, some of the more ambitious manufacturers handling even barley with creditable results. Consumers are learning that the smaller sizes of anthracite have the same admirable inherent qualities possessed by stove and egg coal and that their utilization is comparatively simple. A few more years may see buckwheat (Buck No. 1) quite as universally applied to domestic use as pea is at present.

Probable life of the anthracite coal reserves. A matter of constantly recurring interest is the probable life of the anthracite-producing region; that is, for how many years will an adequate supply of this coal be available?

The largest reserves are in the fields presenting the most difficult mining conditions, the heaviest loss in mining, and the largest proportion of the less important steam sizes. A comparison of the relative exhaustion to produce a ton of domestic sizes under comparative conditions is shown in table 71.

At their present rate of exhaustion the Northern and Eastern Middle Fields will be the first to show decreasing production. If the demand for anthracite persists, their waning production must then be made up by increased tonnages from the Western Middle and Southern Fields. The demand will probably still be for domestic sizes. The above table shows that in these latter fields production of a ton of these sizes involves a much larger inroad

TABLE 71

YIELD	PERCENTAGE OF OUTPUT INCLUDED IN DOMESTIC SIZES	TONS PRODUCED TO YIELD A TON OF DOMESTIC SIZES	TONS LOST PER TON PRODUCED	TONS EXHAUSTED PER TON OF DOMESTIC SIZES PRODUCED
Northern	70	1.43	0.49	2.13
Eastern Middle	61	1.64	0.44	2.36
Western Middle	58	1.72	0.72	2.96
Southern	53	1.89	1.04	3.85
Entire region	64	1.56	0.64	2.56

on the coal reserves. The relative proportion of this tonnage made up by each of these fields will therefore have a great effect upon their respective lives, as will the possible extent of the total demand through years to come.

Sizes now used for steam only may then be used for domestic purposes. The constantly increasing cost of production may seriously limit the demand by bringing into economic competition other fuels. Again, the demand may reach unexpected proportions as necessity arises for smoke abatement in congested urban districts. All of which goes to show that any attempt to fix a definite life to any specific field, or to the region as a whole, is extremely difficult. Furthermore, the results attained cannot be very reliable, no matter how carefully the estimate is made.

With so many uncertain factors involved, not the least of which

is the precise amount of coal remaining in the ground, it is impossible to give exact figures as to the future life of the anthracite mines. Most estimates place the life at the present rate of production at somewhere between 60 and 120 years; say, very roughly, 100 years. The Eastern Middle and Northern Fields, however, will be practically exhausted long before that period of years.

In any case there will be some collieries in each field producing coal in small amounts long after these periods, but it appears that the expiration of 80 years will begin to see the present production rapidly fall.

Substitute fuels. Substitute fuels may affect the consumption of anthracite and in that way have an influence on its productive life. Artificial gas—and within prescribed limits electricity—are convenient for cooking and are replacing anthracite in the cities. Neither is practical for heating. Oil is an economical fuel for cooking and is used to some extent for heating, principally because of its convenience. It cannot compete efficiently for this purpose with anthracite at its present price. Briquets either of anthracite or bituminous coal have not generally proved satisfactory because of smoke and fumes from the tar or petroleum binder. Carbocoal and anthracoal have not yet been regularly produced on a commercial scale. Wood is used rarely and the best low volatile bituminous coals, though having greater heat value, are comparatively dirty fuels.

The only substitute for anthracite so far developed and at all comparable with its cleanliness, lack of smoke, convenience in use and cost is coke, a product of bituminous coal. This coke can be made in by-product ovens, the gas sold for cooking, lighting and manufacturing, and the coke delivered to the consumer at a dollar or two less per ton than chestnut size anthracite.

A ton of by-product coke will supply as much heat as a ton of anthracite. Being lighter in weight it requires larger storage space, but in compensation it makes less ash. It requires no more skill or experience in its use than does anthracite and will win constantly widening application, especially in those centers remote from the anthracite regions, where freight rates make up too large a portion of the delivered price of hard coal.

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RADIO IN THE MINE

TABLE 72

Distribution of consumers' dollar paid for stove size anthracite per ton of 2000 pounds

CITIES		AVERAGE PRICE AT CONSUMERS' CURB†	AMOUNT IN CENTS PAID OUT OF EVERY DOLLAR CHARGED FOR COAL AT CURB*		
			Mines	Freight	Dealer
Boston	1920	15.86	47	26	27
	1921	15.30	46	27	27
	1922	15.68	45	23	32
New York	1920	14.15	51	19	30
	1921	13.13	52	21	27
	1922	13.77	56	18	26
Philadelphia	1920	13.05	60	19	21
	1921	12.89	61	19	20
	1922	12.93	61	16	23
Washington	1920	13.74	52	25	23
	1921	13.20	57	25	18
	1922	14.20	58	20	22
Buffalo	1920	13.22	57	26	17
	1921	13.14	58	27	15
	1922	13.22	60	22	18
Detroit	1920	16.61	41	28	31
	1921	14.48	48	32	20
	1922	15.52	49	27	24
Chicago	1920	16.95	46	34	20
	1921	15.71	47	37	16
	1922	16.57	49	30	21
St. Louis	1920	16.37	40	40	20
	1921	15.98	45	40	15
	1922	16.13	50	35	15
Indianapolis	1920	14.75	45	38	17
	1921	15.50	47	35	18
	1922	15.75	48	31	21

* These figures were obtained from the books of retail dealers by agents of the Commission and cover the month of November in the three years 1920–1921 and 1922.

Transportation. Summer storage of anthracite in the cellar of the consumer and large storage by producers and distributors permit a rail movement of this coal practically uniform throughout the year. The major portion of the product is domestic fuel. Anthracite mines always receive a full car supply, as car rating and distribution rules do not apply to anthracite as they do to bituminous mines. There has been no material loss of production in modern times because of inadequate transportation. Transportation is not considered a limiting factor, nor have there been any serious complaints of failure to move all the coal produced or demanded.

Price. The anthracite consumer is interested primarily in the price he pays for coal delivered at his curb. This price consists of the cost of production plus the operator's margin, which together make the mine price, the freight rate, the dealer's cost of doing business and his profit. Lacking the information necessary to divide these items into their cost and profit components, table 72 shows the parts of every dollar paid by the consumers in nine cities, which go to the operator, the railroad and the dealer, the distribution being respectively to mines, freight and dealer. It is to be noted that the table covers stove-size coal only, and that the prices are for a net ton of 2,000 pounds and not the gross ton of 2,240 pounds.

The information upon which this table is based, and which was taken from the books of 91 retail dealers in the cities named by agents of the Commission, shows an average uniformity of mine price. In 1920 and 1921 the freight rates ranged from $2.45 at Philadelphia to $6.44 at St. Louis. In November, 1922, they were about 10 per cent lower than in 1920 and 1921. All commissions to middlemen were included in the mine price.

CHAPTER XIII

Production Costs and the Distribution of Anthracite

1. cost of production

The Commission received from the anthracite operators information covering their costs during the calendar years 1919-1922 and the first quarter of 1923. It also had access to a large amount of similar material previously collected by the Federal Trade Commission. The data for the earlier years, when supplemented with that collected by the Coal Commission, show a ten-year trend of costs. That the information presented is typical is evident from the fact that the figures available for the years 1913-1922 cover about 80 per cent of the commercial production during those years, while the figures for 1917 and subsequent periods relate to approximately 98 per cent of such production. All references to tons in this chapter are for gross tons of 2,240 pounds.

Anthracite operators are usually classed as "railroad coal companies" and "independents." Operators in the former class, some ten in number, are affiliated with the principal railroads traversing the anthracite coal region. They annually produce about three-fourths of the total tonnage, while the independents, of whom there are more than one hundred, mine the remainder. The railroad coal companies conduct large operations and own vast areas of coal land, part of which, in addition to that mined by themselves, is held in reserve, leased to others on a royalty basis or both. The independent companies as a class own very little coal land, but operate chiefly on a small scale on leased lands.

In explanation of differences in sales realization the two-fold character of anthracite production should be remembered. Anthracite is primarily mined to secure the domestic, or what are otherwise known as the "prepared" sizes. The steam sizes are incidental. They are a by-product. Another source of the steam

sizes besides that fresh mined is the reclamation of culm banks and the dredging of rivers in the anthracite territory. As only some five per cent of the total commercial tonnage produced is obtained from these two latter sources, such reconditioned coal may be disregarded entirely here.

The principal subdivisions of costs are (1) Labor, (2) Supplies, and (3) General Expense, the sum of these three making (4) Total F. O. B. Mine Cost. The information on labor and supplies costs, whether secured by the Federal Trade Commission or the Coal Commission, is practically comparable. The chief variation, and it is slight, lies in the figures of General Expense and is due to the different basis used in determining the amount of certain depletion and depreciation charges. The Federal Trade Commission always "revised" depletion and depreciation charges based on values in excess of the amount of original investment by reducing them to the original cost basis or, if this value was unobtainable, to the average charges shown for the field. The Coal Commission, on the other hand, tabulated without "revision" the figures which the operators in their sworn reports gave as being carried on their books. As a net result of this difference in method the average General Expense costs and likewise Total F. O. B. Mine costs per ton are higher for the periods beginning January 1, 1919, as compared with the costs for periods before that date by 14 cents for railroad coal companies, 17 cents for the larger independent companies, 15 cents for the smaller independents, or 15 cents per ton for all the operators considered in a single group.

Selling expenses are not included in the production costs described above. They were treated as a deduction from total Sales Realization figures. By so handling them the income from coal sales represents the net amount actually received by operators for their product. This method was used by the Coal Commission in arriving at the sales realization derived from the original figures reported by the operators to the Federal Trade Commission. That Commission did not use this method for the figures shown in their published report. It found, however, that the

average amount of the item of Selling Expense was 10 cents per ton.[1]

Examination of the figures available to the Coal Commission for 13 operators, beginning with January, 1913, showed that for the three years 1913-1915 total F. O. B. Mine costs or costs of production varied only one cent per ton from $2.30 in the former year to $2.29 in the latter. Sales Realizations also during these years showed only minor fluctuations. Seasonal changes—summer and winter demand—in cost, however, showed a somewhat wider range. The wage scale for these years, 1913-1915, being unchanged, the differences in cost and sales realizations are primarily attributable to changes in production. These conditions of uniformity are in marked contrast to those found immediately following 1915.

Beginning with January, 1916, increases were regular as regards production costs. This upward movement was caused by higher wages paid to labor as the result of some seven different wage agreements during the period 1916-1923, increased cost of material and supplies and higher charges for general administrative and overhead expenses. For the same 13 operators referred to in the preceding paragraph costs per ton for labor increased from $1.65 during the first quarter of 1916 to $3.97 for the corresponding quarter in 1923, an increase of 140.6 per cent. Supplies or materials costs increased during the same period for these operators from 33 to 72 cents per ton, or 118.2 per cent. General expenses rose from 40 cents to 77 cents per ton (the latter figure being adjusted to the Federal Trade Commission basis so as to be strictly comparable), or an increase of 95 per cent. The result of these several changes in costs made an increase in the Total F. O. B. Mine Cost from $2.38 to $5.46 (the latter figure adjusted also), or 129.4 per cent.[2] During this same seven-year period

[1] See Federal Trade Commission Cost Reports—Coal, No. 2, Pennsylvania Anthracite, p. 48.

[2] Because of differences of accounting methods in respect to depletion and depreciation the General Expense and the Total F. O. B. Mine Costs shown on the operator's reports to the Coal Commission, although following the Treasury Department's requirements, are not strictly comparable

Sales Realizations of $6.67 per ton in the period January-March, 1923, had increased $3.93, or 143.4 per cent. The increase in the tonnage production in the respective quarters increased only slightly more than 5 per cent.

Besides the detailed information secured for the above described 13 operators in the anthracite region, similar data were secured from 35 additional independent producers, or a total of 48 identical companies. This latter material, however, begins with the period January-April, 1917, and is continuous through March, 1923, with the exception of the second and third quarters of 1922, when there was a strike. A comparison of the total F. O. B. Mine costs for these 13 companies with those for 48 companies who produced about 90 per cent of the total fresh-mined output during the periods specified in the table below shows the close similarity existing between the two groups. This uniformity is largely due to the inclusion in both sets of figures of the information covering the ten railroad coal companies, which mine approximately three-quarters of the tonnage produced by all the operators.[3]

In addition to the figures given above, which cover two groups of identical operators over long periods, information was also secured from a considerably larger number of operators for each of the four years, 1919-1922, and for the first quarter of 1923. This latter information, while not covering the same operators each year, is very useful in showing the representative character of the previous data. The largest number of operators from whom costs were obtained for any one year by the Coal Commission was

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with the costs as determined by the Federal Trade Commission for earlier years. To make them comparable it is necessary to deduct 15 cents from the costs as now reported. Another way to make the two sets of figures comparable would be to add 15 cents to the costs as determined by the Federal Trade Commission.

[3] Similar figures for these periods, showing railroad coal companies and independents separately and also the three principal subdivisions of Total F. O. B. Mine Cost (Labor, Supplies and General Expense), will be found in the Coal Commission's report on "Cost of Production of Anthracite Coal," as will information covering Sales Realizations and Margins.

74 for the year 1921. Their average F. O. B. Mine Cost for that year was $5.85, and the production included by them was 68,120,749 gross tons, or practically 95 per cent of the total commercial tonnage of anthracite mined in 1921.

TABLE 73

Total f.o.b. mine costs per ton of 13 companies and 48 companies by specified periods, January, 1917, to March, 1923[4]

PERIOD	13 COMPANIES	48 COMPANIES
January–March, 1917	$2.62	$2.67
April–August, 1917	2.82	2.88
September–November, 1917	3.03	3.08
December, 1917–October, 1918	3.67	3.74
November–December, 1918	4.72	4.80
January–March, 1919	5.06	5.13
April–June, 1919	4.64	4.68
July–September, 1919	4.63	4.66
October–December, 1919	4.84	4.87
January–March, 1920	5.05	5.09
April–September, 1920	5.72	5.73
October–December, 1920	5.96	6.00
January–March, 1921	5.80	5.86
April–June, 1921	5.57	5.63
July–September, 1921	5.77	5.83
October–December, 1921	5.92	5.95
January–March, 1922	5.67	5.67
April–September, 1922	*	*
October–December, 1922	5.55	5.58
January–March, 1923	5.61	5.66

* Strike period.

The following brief summary shows (table 74) the number of companies submitting under oath usable reports to the Coal Commission, the tonnage produced by them, and their average Total F. O. B. Mine Cost.

While costs and sales realizations of anthracite operators have

[4] See footnote 2.

been increasing within recent years, the division of the purchaser's dollar, F. O. B. Mine, since the war has not been greatly changed, except as a result of the unusual market conditions with resultant high prices prevailing in the six-month period following the 1922 strike. This dislocation of operations caused a loss for the year 1922, when taken as a whole, although the quarterly periods prior and subsequent to the strike showed favorable operating conditions. This situation is fully set forth in the Commission's report.

TABLE 74

Number of companies submitting reports to the Coal Commission, showing tonnage and total f.o.b. mine cost

PERIOD	NUMBER OF COMPANIES	TOTAL COMMERCIAL PRODUCTION	AVERAGE F.O.B. MINE COST OF PRODUCTION PER TON
		gross tons	
Year, 1919	64	62,787,258	$4.80
Year, 1920	70	60,983,846	5.68
Year, 1921	74	68,120,749	5.85
Year, 1922	70	37,503,198	6.50
January–March, 1923	66	18,049,548	5.68

As a result, however, of the heavy demand for coal in the last quarter of 1922 and the first quarter of 1923, production was considerably above that for the corresponding quarterly periods in the preceding three years. This temporary situation was favorable to the operators, since it reduced their unit costs of production and increased the percentage going to form the margins.

The following brief statement, covering January, 1919, to March, 1923, shows the division of the purchaser's dollar, f. o. b. mine, between costs and margins of 48 identical operators.

As already pointed out, the results shown for the first quarter of 1923 should be somewhat discounted as revealing what could be expected for the entire year, because of the abnormal market conditions after September, 1922.

As indicative of the influence on costs of production of irregular operation or an absolute suspension of work over any considerable period, attention is called to the figures covering the year

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A Young Miner

1922, in which there was a complete cessation of mining for over five months. During the first quarter of 1922, when production was slightly above that of the preceding quarterly period in anticipation of a strike beginning on April 1, 1922, the several items of cost, while somewhat lower, were fairly regular and comparable with those of similar recent quarterly periods. In the quarterly period immediately after the strike, costs were also lower, due to the heavy production to meet the abnormal demand for coal. Of the tonnage mined in the first three months of 1922 by the 48 operators mentioned earlier, about 15,600,000 tons were produced at an average f. o. b. mine cost of $5.67, while in the last quarter

TABLE 75

Division of the purchasers' dollar, f.o.b. mine, between costs and margins of 48 identical operators, 1919–1923

PERIOD	AVERAGE SALES REALIZATION PER TON	PER CENT OF PURCHASERS' DOLLAR TO:				
		Costs				Margin
		Labor	Supplies	General expense	Total f.o.b. mine cost	
Year, 1919	$5.32	63.35	14.29	12.96	90.60	9.40
Year, 1920	6.18	63.27	14.24	13.59	91.10	8.90
Year, 1921	6.48	62.50	13.73	13.43	89.66	10.34
Year, 1922	6.32	68.67	13.92	19.62	102.21	2.21*
January–March, 1923	6.89	57.04	10.74	14.37	82.15	17.85

* Loss.

of 1922—approximately 16,400,000—were produced at an average of $5.58. The total tonnage of 32,000,000 tons for the combined quarters was produced at an average f. o. b. mine cost of $5.62.

In the remaining six months of 1922, the second and third quarters, occurred a prolonged strike of five months. In the other one month of the period the 48 companies produced only about 3,000,000 tons. During this same six months, however, their operating figures showed an expenditure of over $46,000,000 as applicable to costs of production. While part of this outlay was for labor in maintaining the mines and for protection of the property, by far the greater portion was for general administrative

and overhead expense which is unavoidably incurred whether there is production or not. Thus the costs of production for the 48 operators increased over 80 cents per ton, from an average of $5.62 for the first and last quarters combined, to $6.46 for the entire year 1922. As the average sales realization of these same operators for 1922 was $6.32 per ton, the strike and expenses incidental to it created a loss for them of 14 cents per ton.

2. THE DISTRIBUTION OF ANTHRACITE

The distribution problem. About 74 per cent of the total production of anthracite comes, as has already been noted, from the mines of eight large producing interests, known in the trade as "Companies." These large companies sell the bulk of their product directly to the retailer or consumer, either through their own selling departments, or affiliated selling companies, or through contract commission sales agents, making only the minimum use of the independent wholesaler. The remaining 26 per cent, or thereabouts, is produced by over one hundred relatively small producers, known in the trade as "Independents."

In recent years the production of the "Companies" has been sold at prices f. o. b. mines which are so stabilized that they do not fluctuate sharply with the demand for coal. Independents, except for a few of the larger ones, which similarly announce and maintain their prices over considerable periods of time, sell their product at the best price obtainable on the market at any given time. When anthracite is plentiful they can obtain no more, and often obtain less, than company prices. When shortages occur, however, independent prices are higher than those of the companies, the amounts by which they exceed company prices being known as "premiums." Under the Fuel Administration control during the war a premium of 75 cents per gross ton, f. o. b. mines, was allowed independent producers, but during the shortage created by the strike of 1922, in the absence of any direct control over prices, premiums of $3.00, $4.00, or even $5.00 or more per ton at the mines were realized by certain independents on a portion of the domestic sizes they produced.

The same difference in policy between the "companies" and

the "independents," with respect to their prices f. o. b. mines, runs through their methods of wholesale distribution. The "companies" generally market their coal through selling departments or financially affiliated sales companies, or through independent commission sales agencies, of much the same type as those previously described for the large bituminous coal producers. (See Chapter III, p. 119.) They need not be discussed further here except to note that the policy of stable circular prices is carried through the wholesale transaction, so that the retailer buying direct from "company" connections receives his coal at prices that are announced periodically and remain unchanged over considerable periods of time.

The distribution of "independent" coal, on the other hand, is largely handled by independent wholesalers or independent commission sales agents, and their charges may add still more to the premiums which the independent operator often obtains. The tonnage handled by such independent wholesalers is relatively small—probably not more than 15 or 20 per cent of the entire output—but, as will be shown, it exercises a controlling influence on the retail price. The tabulation of costs and profits on page 358 includes only such independent wholesalers and excludes two large general sales companies and two large commission sales agents which take the place of sales departments of the so-called "companies."[5]

[5] The sales companies and independent commission sales agents excluded were as follows:

a. *The Lehigh Valley Coal Sales Co.,* organized in 1912 to market the entire output of the Lehigh Valley Coal Co., and Coxe Bros. and Co., Inc., representing the coal interests of the Lehigh Valley Railroad Co. In 1912, 97 per cent of the stock of the Lehigh Valley Coal Sales Co., was purchased by stockholders of the Lehigh Valley Railroad. A decision of the United States Supreme Court in 1920 ordered the dissolution of intercorporate relations existing between the Lehigh Valley Railroad Company and its producing companies, and declared void the contract between the Lehigh Valley Coal Company and the Lehigh Valley Coal Sales Company. Pending the final adoption of plans to meet the requirements of the decree the Coal Sales Company has continued to purchase and market without contract the output of the coal company.

Premium markets offer opportunity for large profit-taking by independent wholesalers who buy outright and obtain title to low-priced coal of domestic sizes, which they can then sell at much higher, or premium, prices. So attractive is this type of business to the speculative wholesalers that each recurrent premium market

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("Competition in the Anthracite Industry," a statement on behalf of the general policies committee of anthracite operators to the U. S. Coal Commission June 13, 1923, p. 58-59.)

b. *The Delaware, Lackawanna and Western Coal Co.,* organized in 1909 to purchase at the mine mouth coal produced by the Delaware, Lackawanna and Western Railroad which wished to continue the operation of mines but could not legally, under the Commodities clause of the Hepburn Act of 1906, own coal when in transit in interstate commerce over its railroad lines. Ninety-nine per cent of the stockholders of the Railroad Company subscribed for stock of the Delaware, Lackawanna and Western Coal Company paying their subscriptions in full from a cash dividend of $13,100,000 declared by the Railroad Company. A Supreme Court decision in 1913 necessitated the modification of contractual and other relations between the two companies, but the Delaware, Lackawanna and Western Coal Company continued to market the coal of the Railroad Company until in September, 1921, the coal lands and mining operations of the Delaware, Lackawanna and Western Railroad were turned over to the Glen Alden Coal Company. Since September, 1921, the Glen Alden Coal Company, the majority of the stock of which is owned by stockholders of the Railroad Company has continued to sell its output through the Delaware, Lackawanna and Western Coal Company, the stock of which was originally owned by stockholders of the Railroad Company but it is claimed has since become somewhat more widely dispersed. (Ibid., p. 33-48.)

c. *Williams and Peters,* an independent partnership handling on commission the output of the mines of the Pennsylvania Coal Company and the Hillside Coal and Iron Company. The entire outstanding stock of the Pennsylvania Coal Company and the Hillside Coal and Iron Company is owned by the Erie Railroad Company. Following the death of one of the partners, the affairs of Williams and Peters were wound up in 1923 and its position as commission sales agent has been taken over by Pattison and Bowns, Inc., of New York City, for the eastern, and by the Globe Coal Company of Chicago for the western anthracite territory.

d. *Dickson & Eddy,* independent sales agents for coal produced by the Scranton Coal Company and the Elk Hill Coal Company, the capital stock of both of which is owned by the New York, Ontario and Western Railroad Company.

not only stimulates the activities of those already in the trade, but attracts many new wholesalers, some of whom have been aptly characterized as "coal bootleggers." At such times competition among speculative wholesalers ceases to be that of attracting the retailers' tonnage by offering coal at the lowest price consistent with the wholesaling service rendered and becomes that of trying to sell the most needy retailer a car of coal at the highest possible price. Other independent wholesalers, working under definite commission sales contracts, handle the bulk of their tonnages on margins that are at all times fairly commensurate with the wholesale distribution services rendered.

Investments and profits of independent wholesalers. Inquiries of the Commission covered the ten years from 1913 to 1922, inclusive. The typical anthracite wholesaler handles both anthracite and bituminous, and in some cases coke as well, using the same investment and the same office and sales forces for both. His records generally do not show separately the investment, costs or profits for the anthracite as distinguished from the bituminous end of the business. The schedule used by the Commission provided for the reporting of investments and costs in total only, but requested segregation of tonnages to show the quantities of anthracite, bituminous and coke handled, thus making it possible to group separately those concerns whose tonnages were predominantly anthracite.

Of the total number of wholesalers whose reports were tabulated for 1913, 42 per cent handled anthracite to some extent. Ten years later, in 1922, the percentage reporting anthracite tonnages had decreased to 30 per cent of the total number tabulated. Wholesalers for whom anthracite represented more than 50 per cent of the tonnage handled, decreased steadily, from 20 per cent of the total number in 1913 to about 11 per cent in each of the last three years of the period. In no year did wholesalers handling anthracite exclusively represent more than 4 per cent of the total number for whom reports were tabulated.

The following table shows the average margins, profits and investments per ton, and rates of return on investment for two groups of wholesalers, the first group including those dealers re-

porting in each year tonnages of anthracite representing 50 per cent or more of the total tonnages handled by them, and the second

TABLE 76

*Margins, profits and investments of wholesalers whose tonnages were more than 50 per cent anthracite, 1913–1923**

YEAR	NUMBER OF COMPANIES	TOTAL TONNAGE HANDLED	AVERAGE MARGIN PER NET TON	AVERAGE PROFIT PER NET TON	AVERAGE TOTAL INVESTMENT PER NET TON	RATE OF RETURN ON INVESTMENT†
Companies handling more than 50 per cent anthracite						
			cents	*cents*	*cents*	*per cent*
1913	18	10,671,494	10.8	5.4	30.9	17.4
1914	20	10,438,889	11.2	4.3	33.1	12.9
1915	21	12,133,903	11.1	4.7	34.0	14.0
1916	22	14,522,416	15.1	8.7	33.0	26.5
1917	27	17,055,262	21.2	12.0	28.6	42.0
1918	31	17,756,025	15.4	6.7	30.1	22.3
1919	35	15,509,192	15.2	5.6	37.9	14.8
1920	37	17,043,248	31.3	18.8	38.0	49.5
1921	42	13,679,775	18.1	4.4	56.4	7.7
1922	43	12,081,744	22.0	6.8	63.9	10.6
Companies handling anthracite exclusively						
1913	2	1,336,117	13.8	9.1	33.0	27.6
1914	3	1,275,896	16.1	8.9	47.2	18.8
1915	4	1,581,777	14.7	6.6	52.8	12.5
1916	4	1,628,231	19.2	10.8	54.8	19.7
1917	7	1,913,293	30.5	18.8	50.1	37.5
1918	9	2,179,401	24.4	11.6	46.0	25.3
1919	9	1,864,868	22.5	11.4	53.0	21.5
1920	10	1,726,422	34.1	18.2	54.0	33.6
1921	12	1,717,403	25.0	9.6	60.9	15.8
1922	12	1,397,034	29.4	10.5	79.0	13.3

* Compiled from "The Wholesale and Retail Coal Trade," United States Coal Commission, Report L., Table 4, p. 6, and Tables 20, 21, 23, and 25, pp. 21, 23 and 24.

† Rates of return shown in this column are obtained by dividing the total profit by the total investment for all wholesalers included for each year. They are therefore more accurate than rates based on the unit figures appearing in the two preceding columns because the small unit figures have been adjusted to the nearest tenth of a cent, thereby introducing an appreciable error for the purpose of percentage computation.

including only those companies reporting nothing but anthracite. All profits and rates of return were computed before payment of income taxes, and all margins, profits and investments shown are per net ton of 2,000 pounds. Investment, as here given, is the total of capital stock, surplus and borrowed money, including bonds, less goodwill and outside investments.

It is very significant that in neither group did the increase in total tonnage handled keep pace with the increase in number of concerns reporting in the later years. For the group handling anthracite exclusively this is especially noticeable. In commenting on the excess capacity thus indicated for companies handling anthracite exclusively the Coal Commission stated:

> If the two companies were equipped to handle in 1913 almost as much coal as the twelve companies handled in 1922, it is evident that there is excess wholesaling capacity in the group.[6]

Average margins, profits and investments per ton for wholesalers dealing exclusively in anthracite generally were larger than those for dealers combining anthracite and bituminous tonnages, thus reflecting the higher margins normally realized on anthracite coal. The larger investments per ton required to finance the handling of a ton of coal for both groups in the later years of the period covered reflect the working of two factors, the first being the increase in price per ton of the coal handled, and the second the reduced tonnage sold, resulting in a less rapid turnover of capital invested.

For the group combining both anthracite and bituminous tonnages average margins varying in different years from 10.8 cents to 31.3 cents per ton yielded profits ranging from 4.3 cents to 18.8 cents per ton. These profits yielded percentage returns ranging from 7.7 per cent to 49.5 per cent on investments varying from 28.6 cents to 63.9 cents per ton in different years. The year 1914 yielded the smallest average profit (4.3 cents) and the year 1920 the largest average profit (18.8 cents) per ton. In 1921 the small-

[6] U. S. Coal Commission, The Wholesale and Retail Coal Trade, Mimeographed Report L, p. 21.

est rate of return on investment, 7.7 per cent, was realized and the largest rate, 49.5 per cent, was realized in 1920. In other years the rates of return ranged from 10.6 per cent to 42.0 per cent annually.

For the group handling anthracite exclusively, profits per ton, investments per ton and rates of return on investment were not subject to as wide fluctuations from year to year. Profits ranging from 6.6 cents to 18.8 cents per ton yielded percentage rates of return ranging from 12.5 per cent to 37.5 per cent on an investment that varied in different years from 33.0 cents to 79.0 cents per ton. In only four of the ten years was the average rate of return on investment less than 20 per cent.

Margins on individual sales. The average margins and profits shown above are based on the total tonnages handled, including for wholesalers handling anthracite exclusively, both domestic and steam sizes in varying proportions, and for all others, bituminous coal as well. Furthermore, the averages shown above include margins of wholesalers operating under commission sales contracts limiting more or less strictly the amount of margins realized as well as margins realized on coal handled as independent merchants. For margins realized on the latter type of business the only limiting factor is the business policy of the wholesaler and the market situation at the time sales are made.

Prior to 1917 large tonnages of anthracite were wholesaled on margins not exceeding 15 cents per gross ton for domestic and 10 cents per gross ton for steam sizes. During 1917 and 1918 the Federal Fuel Administration established maximum margins for wholesalers not physically handling anthracite coal at 20 cents per gross ton east of Buffalo and 30 cents west of that point. At the present time large tonnages of coal are handled on commissions or margins not exceeding 25 cents per ton.

In taking a cross-section of the wholesale trade during the disturbed market in the fall of 1922, the Commission found that much of the tonnage reported for the week of November 19 to 25, 1922, was handled at margins not exceeding 25 cents per gross ton, but that a considerable part of the tonnage reported bore margins of $1.00 or more, the highest on any one sale being $2.67

per gross ton. Still other sales during this week were made at a loss.[7]

Speculative transactions among wholesalers in times of panic markets result in the "pyramiding" of margins of two or more wholesale transactions in the price finally paid by the retailer. So far as indicated by the Commission's inquiries covering many thousands of tons of premium coal bearing "pyramided" margins of two or more wholesalers during the premium market of 1922-1923, the principal source of such coal was the mines of independent producers. Stray cars of "company" coal escaping from regular "company" distribution channels in which "company circular" prices prevail and losing their identity in passing through the hands of independent wholesalers in a few instances became a source of large profit to the wholesalers, but the number of cars so escaping from "circular" distribution agencies and becoming premium coal, so far as indicated by the Commission's inquiries, was very small.

In tracing the movement of 802 cars of premium coal of domestic sizes purchased by New England retailers from wholesalers during the winter of 1922-23, the Commission found that 500 cars passed through the hands of but one wholesaler at margins ranging from 20 cents to $3.00 per gross ton, the average for the 500 cars being 86 cents per ton; 251 cars passed through the hands of two wholesalers whose combined margins ranged from nothing to $4.75 per ton, the average being $1.75 per ton; 47 cars passed through the hands of three wholesalers whose combined margins ranged from 90 cents to $4.03 per ton, and 4 cars passed through the hands of 4 wholesalers whose combined margins ranged from $1.00 to $1.51 per ton. The wholesalers handling 408 cars, or approximately 50 per cent of the cars traced, added from $1.00 to $4.75 per ton to the prices paid by the retailers. On 302 cars, or approximately 38 per cent of the high premium coal traced, the prices paid by retailers were enhanced by amounts generally ranging from $1.00 to $3.00 or $4.00 per ton on account of the "pyramiding" of the margins of two or more wholesalers han-

[7] Ibid., Table 1 facing p. 3.

dling it.[8] The 802 cars traced constituted a representative sample of the highest priced coal sold by wholesalers, which in turn represented an undetermined part of the 15 or 20 per cent of the total anthracite supply sold at premium prices. Notwithstanding the smallness of the proportion of the total supply affected by the "pyramiding" of wholesale margins, such high priced coal had a disproportionately large influence upon retail prices, as the small percentage of highest price coal entering a given market tended to become the factor which determined the retail price level.

The anthracite producer, under the necessity of finding an outlet for his steam sizes, frequently offers coal in blocks consisting of both steam and domestic sizes. In times of shortage these offerings may include an unusually large proportion of steam sizes at prices higher than the steam market at the time. At such times the wholesaler, anxious to obtain domestic sizes, sometimes buys steam sizes, which he must market at a loss, provided he cannot in turn force them upon some needy retailer along with domestic sizes which the dealer greatly needs. Such sales of steam sizes at a loss are frequently cited by wholesalers as a justification for high margins taken on domestic sizes.

An inquiry by the Commission regarding margins realized during the month of August, 1923, when there was active demand for domestic sizes at high premium prices, but a dull steam coal market, produced statements indicating that 76 wholesalers handled a total of 147,180 tons of steam anthracite at an average margin above cost of 18 cents per ton. Only three of these wholesalers sold their steam sizes at less than the price paid for them by amounts averaging 2.6 cents, 3.8 cents and 4.7 cents per ton, respectively, for the three wholesalers. These three wholesalers realized average margins of $1.75, $.875 and $.551 per ton, respectively, on much larger tonnages of domestic sizes, with the result that the total anthracite business done netted them respectively $1.116, $.772 and $.230 per ton over and above cost of coal handled.[9] In so far as the showing for the 76 dealers is

[8] Ibid., Table 26, p. 27.
[9] Ibid., p. 40-41.

typical of the independent wholesale trade generally it would not appear that losses on steam sizes can justify the high margins taken on domestic sizes in times of shortage.

In its tracing of cars of anthracite through the hands of two or more wholesalers the Commission found in a number of instances chains of separately incorporated wholesalers, which are closely allied in economic interest with each other and with certain of the smaller independent anthracite producers. In times of shortage coal is passed from one member to the other of such chains, each member taking a margin on the transaction. The Commission also found instances in which the mixing of low-priced company and high-priced independent coal, and the sale of the mixture at high prices; the misuse of reconsignment to cause company coal to lose its identity, and other devices were resorted to by wholesalers to exact the largest profits possible under existing premium market conditions. The total tonnage affected by such activities was comparatively small. The practices described are typical of the methods of the so-called "coal bootlegger" rather than of the wholesaler conducting his business on a sound business basis.

Conclusions respecting anthracite wholesaling. The Commission recognized that the wholesaler is a necessary factor in the distribution of anthracite, especially to the small independent producer, whose tonnage is inadequate to support a widespread sales organization, but also that because of conditions of overdevelopment, speculation and duplication of function the activities of independent wholesalers in times of shortage tend unduly to enhance prices to the consumer. Viewing the wholesaling of anthracite as a business affected with a public interest, the Commission recommended that a Federal agency be created "with power to require financial and operating reports, to prescribe uniform methods of cost accounting and to determine the conditions on which coal may be shipped in interstate commerce." The Commission recommended that any fixing of jobbers' prices in an emergency should take the form of limiting to a definite maximum amount per ton the margins that may be taken by one or more wholesalers intervening between the mine and the re-

tailer, the maximum amount to be the same whether taken by one or by two or more wholesalers.

The retail problem. Wherever anthracite coal is used as household fuel the retailer is a necessary factor in its distribution. Yet the retailer who handles anthracite exclusively is no less rare than the wholesaler who handles no other kind of coal. In the Northeastern part of the United States, where its consumption is densest, anthracite represents the bulk of the tonnage of the average retailer, but where its consumption is less dense the reverse is the case.

Most of the difficulties that must be met by the anthracite retailer arise out of the general conditions as to natural monopoly, concentration of ownership, limited production with respect to demand, and frequently recurring premium markets described in the preceding section. It is therefore necessary only to outline at this point how these conditions affect the retailer.

Well-established business connection with an adequate and dependable source of supply is of prime importance to the retailer for several reasons. Naturally the most desirable connection is that with one or more of the large railroad coal companies or their commission sales agencies that sell their tonnages at prices showing the least fluctuation with changes in demand. The next most desirable business relationship is with large "independents" who announce and observe prices in a manner similar to the "companies," and the least desirable is with the remaining "independent" operators and wholesalers whose prices fluctuate with every change in demand.

The typical retailer probably is one who is recognized as a regular customer of one or more "company" sources that furnish the bulk of his supply, which he ekes out by purchases from independent producers and wholesalers. Frequently recurring periods of premium markets have made connection with low-priced "company" sources of such importance that many retailers have come in recent years to live almost in fear and trembling lest they lose their position as preferred customers with the big companies.

Periods of premium prices impose sharp limitations upon competitive retailing, and make good business connection with low-

priced sources of supply more important than efficient retailing in determining the success or failure of retailers. Under the theory that there normally will be but one price at retail for coal in a given market at a given time, the highest priced coal necessary to supply the market becomes the determining factor for retail prices. Retailers purchasing low-priced anthracite cannot in times of shortage get enough coal to supply the market, hence there is no incentive to cut prices below those established by dealers buying premium coal. On the other hand, there is every incentive to advance prices to obtain the added profits to be made thereby.

To test the operation of the theory outlined above a comparison was made of the wholesale prices of "company" and "independent" coal in the cities of New York and Philadelphia, as published in the trade papers, and of the wholesale and retail prices in 51 coal in the cities of New York and Philadelphia, as published in the trade papers, and of the wholesale and retail prices in 51 cities as published by the Bureau of Labor Statistics. As the result of this study the Commission stated that:

> "Independent" coal, representing 25 per cent of the country's production, tends to be the determining factor affecting the retail price level in times of high premium markets, while "company" coal representing 75 per cent of the total production is the determining factor in more normal times. The degree to which retail prices reflect the full premium paid on "independent" coal in times of high prices depends upon the amount of competition existing between dealers having big "company" connections and those who are dependent upon "independent" sources for their supply. Indications are that during the recent shortage . . . retail prices moved approximately in accordance with the theory stated at the outset, namely that advances in retail prices during times of shortage approximate those of "independent" coal.[10]

Margins on anthracite. Dealers throughout the anthracite territory reported the margins realized on anthracite coal. By margin is meant the difference between the cost of coal f. o. b. cars at the dealer's yard (including price paid at mine and freight) and the price at which the coal is sold at retail. The margin covers both the retailer's delivery expenses and his net profit.

[10] Ibid., p. 88-93.

Anthracite margins varied widely with the amount of service rendered. Prices paid by the dealers also affected the amounts of margins realized in the same market by dealers selling at practically the same prices per ton. Margins reported for the year 1922 generally fell within the range from $.75 to $3.50 per ton. The lowest margin reported by a dealer was 13 cents per ton and the highest $6.05 per ton. Low margins generally were due to purchase of premium coal, which was sold in price competition with coal from low-priced "company" sources.

A striking example of the effect of premium and low-priced "company" sources on the margins of retailers was shown for two Philadelphia dealers during the month of November, 1922. Both sold stove coal at $14.50 per gross ton. The first, purchasing low-priced "company" coal, realized $5.25 per ton margin, and the second, purchasing only premium coal, sold his coal for 9 cents per ton less than it cost f. o. b. cars at his yard. During the same month a dealer in New York City selling at $13.25 per net ton realized a margin of $4.51 per ton, while another dealer in the same city selling at $13.75 per ton realized but $2.50 per ton. Similar differences were characteristic of the anthracite trade throughout the country. It frequently happened that owing to the purchase of premium coal, dealers charging the highest prices realized lower margins than others in the same market who sold at lower prices tonnages that were drawn largely, or in some cases wholly, from low-priced "company" sources.

Average margins and profits in the anthracite territory. As stated above, the typical anthracite dealer also handles some bituminous coal, hence it is impossible in the strict sense of the word to segregate a representative group of retailers handling nothing but anthracite. Table 77 shows the tonnages handled and the average margins, profits and investments per ton, and rates of return on investments for two groups of retailers consisting of 86 dealers in New England and 69 dealers in the Middle Atlantic States. Both regions are heavy anthracite consumers and the tonnages of both groups are largely anthracite. The period covered includes five years, 1918 to 1922, inclusive.

Average margins realized by the New England dealers generally were about 50 cents per ton higher than those of the Middle Atlantic States dealers. Average rates of return on investment, however, are similar for the two groups except for the year 1920, when the rate of return for the Middle Atlantic States dealers was about 6 per cent higher than that for the New England States dealers.

TABLE 77

*Retail tonnages, average margins, profits and investments and returns on investment for representative dealers of the eastern anthracite territory, 1918–1922**

YEAR	TONNAGE	AVERAGE MARGIN PER TON	AVERAGE NET PROFIT PER TON	AVERAGE INVESTMENT PER TON	RATE OF RETURN ON INVESTMENT
New England States (86 companies)					
					per cent
1918	2,889,091	$2.270	$0.416	$2.576	16.1
1919	2,543,698	2.432	.366	3.188	11.5
1920	2,601,293	2.924	.610	3.262	18.7
1921	2,379,327	2.807	.546	4.141	13.2
1922	2,190,437	2.948	.587	4.292	13.7
Middle Atlantic States (69 companies)					
1918	6,432,014	$1.814	$0.428	$2.308	18.5
1919	6,117,328	1.894	.344	2.467	13.9
1920	6,417,844	2.336	.631	2.496	25.3
1921	6,106,032	2.542	.535	3.241	16.5
1922	5,749,391	2.337	.390	3.707	10.5

* Compiled from "The Wholesale and Retail Coal Trade," United States Coal Commission, Report L, Retail Section, Table 2, facing p. 53.

In general, the retail trade is overdeveloped, many cities having retail facilities at least double those necessary to handle the tonnage consumed. This overdevelopment results in large investments in yard and delivery facilities, necessitating high profits per ton to yield even moderate rates of return on investment. In its conclusions respecting the retail trade the Commission expressed the belief that even making due allowance for retaining sufficient retailing capacity to meet the peak demand of winter the same retail service could be given in many markets at less

cost to the consumer if there were a small number of dealers using their facilities more nearly to capacity. It was also pointed out that periods of shortage and premium prices place sharp restrictions upon competitive retailing. The Commission felt that even though in many cases public dissatisfaction with the retailer's prices for anthracite is well founded, not all the blame should be placed upon him until the public has itself assumed the responsibility of ascertaining whether it all belongs there, or whether it should be divided between the retailer and other links in the distribution chain. To make well-balanced judgments possible the Commission recommended the collection and publication currently of statistics regarding the production and distribution of anthracite which would enable the public to act intelligently in demanding its coal at a fair price from each of the factors engaged in its distribution.[11]

The Commission believed that the competitive nature of the retail trade makes regulation of retail prices unnecessary except in cases of emergency shortage. Such regulation, when necessary, was regarded as a local responsibility to be undertaken after careful study of existing local conditions. The Commission recommended that in fairness both to the consumer and the retailer, any attempt at local retail price control should take the form of regulation of margins rather than the fixing of definite prices per ton.

[11] This condition of excess facilities is, of course, characteristic not only of coal, but of other lines of retailing as well.

CHAPTER XIV

Competition and Combination

With a natural monopoly of anthracite resources and a large and steady market for the domestic sizes suitable for household fuel, the reasonableness of the producers' profits and the nature of the business organization which they have built up were then examined.

1. Corporate organization of the anthracite industry

The corporate organization of the anthracite industry is in striking contrast to the lack of organization in the bituminous industry.

History. To understand the present organization of the anthracite industry a brief historical preface is necessary.[1] As the Commission pointed out:

> In the first half of the nineteenth century the new fuel gave impetus to the building of canals and railroads, but later these "anthracite" roads sought and gained control of the coal lands, forming a combination of mining and transportation that has been declared illegal by the courts within the past fifteen years, although investigation of the effect of combination began under a legislative committee appointed just one hundred years ago.
>
> . . . The early history of the industry was one of pioneer enterprise in the face of risks and discouragement, a typical American story of initiative, energy, and courage. It is a story of discouraging pioneering and slow development of a market, followed by feverish and ruthless competition of carriers for an increasing traffic, peace in the coal business coming only through pools and agreements expressing community of railroad interests. A number of competing railroad companies built lines

[1] For a more complete account see Jones, "Anthracite Coal Combination in the United States," General Policies Committee of Anthracite Operators, "Competition in the Anthracite Industry" (Philadelphia, 1923), and Walker, "The Development of the Anthracite Combination," Annals of the American Academy of Political and Social Science (Philadelphia, Jan., 1924).

to tap the region, and in the natural desire to obtain traffic entered the business of mining and bought up what was left of the coal-bearing lands. In their haste to prevent other railroads from entering their territory, certain of these carriers bought recklessly, and at what were then high prices, a vast speculative reserve of coal lands, an amount of coal in the ground that they could not hope to transport to market in less than scores, if not hundreds, of years. The industry was overdeveloped much as the bituminous industry is now. Overproduction and slack time were the rule. Prices were low, competition was expensive, and profits were small. When the Anthracite Coal Strike Commission made its report 20 years ago, the industry was only just recovering from a six-year period of overproduction due to mine inflation, when the mine workers especially had shared in the serious losses in that they could be given employment for only 160 to 175 days in the year. It is significant that the Commission attributed the betterment in the conditions in the anthracite industry in 1901 in part to "the gradual concentration of anthracite mining properties in the hands of fewer corporations."

In order to stabilize the industry and to escape from the results of excessive competition, the railroads and their subsidiary mining companies resorted to pooling of traffic, limitation of output, and other devices. These devices to limit competition provoked much popular criticism and some of them have since been declared illegal by the Supreme Court of the United States. One of these devices existed fourteen years before it was finally overruled by the courts. It consisted in joint ownership by the several anthracite roads of the Temple Iron Company, upon whose board of directors were represented all the railroad interests of the region. In 1912 the Supreme Court held that the Temple Iron Company was a combination in restraint of trade and ordered it dissolved. "It has been," said the Court, "an efficient agency for the collective activities of the defendent carriers for the purpose of restraining competition in the transportation and sale of coal in other States."

Another device was a marketing arrangement, the so-called percentage contracts, under which the railroad companies purchased the full output of the individual operators, paying eventually as much as 65 per cent of the average tidewater price, a percentage somewhat related to the high offers of projected competing lines. Orders under these contracts being apportioned according to colliery capacity, one result of the plan was to stimulate mine development without exerting any competitive influence on the market. This non-competitive marketing, which existed for 20 years, was finally terminated by the Court decree of 1912.

The principal and underlying method of limiting competition was the ownership of coal-mining and coal-selling companies by the railroads. The Hepburn Act, passed by Congress in 1906, largely with the relations of the anthracite carriers and their subsidiary mining companies in mind,

prohibited a railroad from entering directly or indirectly into the production and sale of coal in competition with any shipper on its lines. Suits brought by the Government in 1908 later resulted in decisions of the Supreme Court directing the divorce of the coal and the railroad properties of three of the principal anthracite interests.

Since 1923, when the Commission made its report, there have been certain changes in the direction of more complete segregation of coal properties from railroads. The situation is here described as it then appeared to the Commission.

Conditions in 1923. As a result of this historical evolution, the anthracite operators of today fall into two groups: The "Railroad Coal Companies" and the "Independents." In the report of the Commission the former group included the Delaware and Hudson Company and Hudson Coal Company (shown as one operator), the Pennsylvania Coal Company, Hillside Coal and Iron Company, Lehigh Coal and Navigation Company, Lehigh Valley Coal Company, Coxe Bros. and Company, Inc., Scranton Coal Company, Philadelphia and Reading Coal and Iron Company, Lehigh and Wilkes-Barre Coal Company and the Delaware, Lackawanna and Western Railroad Company, with its successor, the Glen Alden Coal Company. The Susquehanna Coal Company, at one time a "railroad coal company," is now classed as one of the "independents."

The degree of combination and its effect on competition, as found by the courts in the dissolution cases, is significant. Eight producing companies, affiliated to some extent with the railroads, produce 74 per cent of the total output and control 90 per cent of the underground reserves. The remaining 26 per cent of the output is contributed by a number of independent companies. The largest of these "independents" retains a community of interest with one of the railroads, and nine others control 13 per cent of the output. Until the decree of the Supreme Court went into effect the Reading and an affiliated company, the Central Railroad of New Jersey, produced 20 per cent of the total annual output and controlled more than half of the unmined reserves. Through these affiliations of railroads and mining companies the same financial interest controlled both the production and the transportation of coal, and commonly also its wholesale distribution, either through

the selling department of the mining company or through a separately incorporated, but financially related selling company.

The "independents" have been losing ground in the proportion of the total output produced, through absorption by the larger companies and through gradual exhaustion of their lands. In 1895 the "independents" produced 45 per cent of the tonnage; in 1905, 25 per cent; in 1921, even after dissolution of the Temple Iron Company, 24 per cent and, indeed, if the Susquehanna Collieries Company be included with the "railroad" group, the proportion of the total annual production of anthracite contributed by the "independents" in 1921 would be only 19 per cent.

In its report on the anthracite industry, the Commission declared that:

Real benefits have flowed to the public from strongly financed companies, although these benefits were largely offset in earlier years by the illegal practices which the courts condemned. The anthracite mines have conserved the country's coal resources by steadily increasing the percentage of coal in the ground recovered and sent to market; they have economized in the capital employed by a closer adjustment of mine capacity to production and in man power by largely eliminating the cost of idle days for men as well as for plants, resulting in a corresponding improvement in the economic condition of the mine workers.

The close-knit organization of the industry has proved its capacity for public service during periods of acute shortage. The control of distribution during the crisis of 1922-23, which has already been described, was left largely to the big companies themselves, and their performance, the Commission stated, "would have been impossible in the competitive bituminous coal industry which possesses neither the records, the machinery, nor the discipline necessary for such an undertaking." * * * "This Commission desires to pay public tribute to the restraint and good judgment displayed by the responsible shippers of anthracite during that trying period. In a less centralized industry prices could have been held down only by arbitrary Government action such as was authorized during the war by the Lever Law."

The development of large and strong companies with centralized control may be a source of danger as well as of benefit. Ownership by railroads of the mines whose product they transported resulted in conditions fundamentally unsound. Financially weak roads have owned what are believed to be profitable mines, much stronger roads have been burdened with much poorer mines, and dividend-paying roads have been favored with dividend-paying mines, with the net result that the record of this

Anthracite Breaker and Culm Pile

mixture of transportation business with mining business is full of uncertainties as to what have been the real profits and on what investment these profits have been earned. It is a wise national policy that has forced the separation of the two types of business, the actual relationship of which should be publicly known, not concealed in a maze of accounts.

Finally, the Commission stated its general views in the following language:

The fundamental fact in the anthracite coal problem is that heretofore these limited and exhaustible natural deposits have been in the absolute private possession of their legal owners, to be developed or withheld at will, to be leased for such royalties as could be exacted, to be transported and distributed at such rates and in such manner as a double-headed railroad and coal combination might find most advantageous from the point of view of private profit, to be sold at such prices as could be maintained by the restriction of output and the elimination of independent competitors, through such means as the maintenance of freight rates burdensome except to those who, owning both mines and railroads, could afford to be indifferent as to whether their revenue came from the one source or the other.

The Commission does not recommend the abolition of existing property rights, however much might be said for the view that mineral deposits should have been held from the beginning as national rather than individual property. The Commission does not recommend Government ownership either by purchase at present value or by expropriation. It does, however, hold the view that a limited natural monopoly like anthracite, held by a relatively small number of individuals, estates, and companies, and supplying a necessity of life for millions of our people, cannot continue to be treated as if it were not affected by a public interest.

2. MARGINS, INVESTMENTS AND PROFITS

The investment and profits of anthracite operators is a complicated subject. The Commission said:

The Commission has found itself confronted with conflicting claims as to the basis upon which the rate of income should be reckoned. One claim is that the current market value is the proper measure of value. Another that the income should be reckoned upon original cost; another that it should be determined with reference to cost of reproduction. The Commission has deemed itself justified in finding as a fact that the mining and transportation of coal in interstate commerce impresses that commodity with a public use. The problem of valuing anthracite, therefore,

while not strictly analogous, bears some resemblance to the problem of valuing a public utility for the purpose of regulating rates. It will not be found that the courts have laid down a single formula for ascertaining value. Each case seems to rest upon its own merits and the courts have considered original cost, stock and bond issues, and the cost of reproduction, and have been governed in their decisions sometimes by one element and sometimes by another. As the Commission is not called upon to determine judicially the valuation of these properties, it does not deem it prudent to lay down a rule for making such valuation. The Commission has rather deemed it to be its duty to set forth for the use of Congress and the public all the information on these subjects which it has been able to obtain.

Much of what has been said in Chapter III in regard to the margin and to the determination of investment and rate of profit applies equally to the problems met in considering the anthracite industry, and will not be repeated here.

The margin. Some light on profits is thrown by the margin per ton. The margin is the difference between the cost of production and the average sales realization, f. o. b. mine, on all coal sold. Selling prices alone cannot be compared with the average cost of production. Since only the anthracite coal in sizes above pea sells at prices generally higher than the average cost of mining, and the steam sizes sell considerably below that cost, market prices give little clue, except as the operator's proportion of large sizes and small sizes is known. But the *average* sales realization on all sizes can be compared with *average* cost for the *same* company or for groups made up of the same companies. The margin includes all the earnings from the mining of coal available for payment on account of capital, whether paid out in Federal taxes, as interest, as dividends, or reserved as surplus. The margin is, therefore, simply what capital, whatever its amount in the business, received for services rendered in mining the average ton of coal, and thus the margin per ton as capital's wage is fairly comparable in nature with the wages paid per ton to mine labor. The margin is not the same as profit. From it must first be deducted Federal taxes and interest on borrowed money before the amount available for the owners of the business is known. Even then it cannot be translated into terms of per cent return on the investment until the investment per ton is known, and as the investment

of different operators varies, so the margin necessary to profitable operation varies from operator to operator.

Range of margins. The margins of anthracite operators show wide variations. In the year 1921 there were three operators who reported to the Commission a margin in excess of $1.50 a ton.

TABLE 78

Range in margin per ton—1921

(Fresh-mined coal, all companies reporting representing 99 per cent of the commercial tonnage)

	NUMBER OF COMPANIES	PRODUCTION	PER CENT OF OUTPUT	CUMULATIVE PER CENT
		gross tons		
Companies reporting cost in excess of sales realization	39	4,933,000	7.2	7.2
Companies reporting a margin of:				
$0.01–0.04	2	3,460,000	5.1	12.3
.05– .09	1	190,000	.3	12.6
.10– .14	1	67,000	.1	12.7
.15– .19	2	239,000	.4	13.1
.20– .29	6	1,918,000	2.8	15.9
.30– .39	2	2,453,000	3.6	19.5
.40– .49	5	14,529,000	21.3	40.8
.50– .59	4	16,272,000	23.9	64.7
.60– .69	1	98,000	.1	64.8
.70– .79	3	6,954,000	10.2	75.0
.80– .89	3	11,032,000	16.2	91.2
.90– .99	2	839,000	1.2	92.4
1.00–1.24				92.4
1.25–1.49				92.4
1.50–1.74	3	5,136,000	7.6	100.0
Total	74	68,120,000	100.0	100.0

One of these was a railroad coal company and two were small independents. Together they mined 7.6 per cent of the total output. But in the same year there were eight other operators who reported to the Commission a loss of over $1.50 per ton. These eight operators were all very small producers, and together they contributed but one per cent of the total output. They were "independents"

who had high costs and who could not get satisfactory prices under the market condition of that year.

Between these extremes were ranged the remainder of the 74 companies reporting, as shown in table 78.

In all there were 39 companies in 1921 that reported to the Commission either no margin or a sales realization less than cost. In the aggregate they produced 7.2 per cent of the total output. The average margin for the entire 74 companies was 54 cents, but an average composed of such unlike elements may be very misleading. While the average was 54 cents, 12.6 per cent of the output was produced at margins less than 10 cents, and 19.5 per cent was produced at a margin less than 40 cents. Much the same situation is shown by the figures for other years.[2]

Like the other data on costs, sales realization and margin presented by the Commission, the foregoing figures are compiled from the reports as submitted under oath by the operators without revision in any way by the accountants of the Commission. The size of the margin, therefore, depends to some extent upon the bookkeeping practices of the company. Different bookkeeping practice, especially with respect to depletion and depreciation, might show larger margins, or might raise a company from the group showing costs greater than sales realization into the group showing a margin.[3]

[2] It is characteristic of the anthracite industry with its large variations in cost that at the same level of prices some operators make large margins and others make small margins. There are, to be sure, some other causes of this great spread in margins besides the simple variation in the production costs of the companies. The margin depends on price, as well as upon cost, and the prices of the "independents" are generally higher than those of the "railroad coal companies," in times of shortage and lower in times of abundant supply. The differences between the customary price policies of these two classes of anthracite operators have already been pointed out.

[3] For example, in the year 1920 one of the largest railroad coal companies, in its cost reports to the Commission, showed a cost 14 cents per ton in excess of sales realization. The same company also furnished the Commission with its income account, which instead of a loss showed a net income of $3,270,344 or 40 cents per ton produced. The difference, it was explained by the company, arose chiefly from a difference in deple-

In partial explanation of the large number of companies reporting no margin or a cost in excess of sales realization, it should be noted that this group includes a number of subsidiaries of other more prosperous companies and that the interest as a whole may show a profit, although the books of the subsidiary show a loss. The fact remains that the anthracite mining industry is characterized by the widest variation in profit and all proposals to limit prices, as was done, for example, by the Fuel Administration during the war, must be considered in the light of their effect upon the no-profit small-margin operators and not alone upon the average operator. The margins of the high-profit companies are clearly larger than necessary to return an adequate income on the average investment, but the effect of any cut in the margin must be gauged not only with respect to the average operator or to the high-profit operator, but also with respect to the low-profit operator.

Trend in margins, 1913-1923. The average margin does not disclose the range in profits, but the average for the same companies

tion charges. A higher rate of depletion was charged in its cost report to the Commission than was carried upon its books of account, from which books stockholders' dividends and profit and loss accounts are calculated.

The company furnished the Commission with a statement of the amounts by which its income, as shown by the books of account, exceeded the figures of net income on its cost reports. These amounts were as follows:

1919	$1,325,277
1920	1,601,408
1921	1,555,272
1922	3,515,103
1923 (January-March)	281,768

The very large difference in 1922 was due chiefly to an item of nearly $2,000,000 for "maintenance expense during strike" included in the cost reports to the Commission though not charged against income on the company's books of account.

Obviously, had the cost reports of this company been based on the same practice as its books, the margins it showed in 1919, 1921 and 1923 would have been larger, and its loss of 14 cents per ton in 1920 would have been converted into a margin.

over a series of years will indicate whether profits are increasing or decreasing.

The Commission's report on "Cost of Production of Anthracite" showed that present margins per ton are much larger than those before the war. The following table shows the margins for thir-

TABLE 79

Changes of margins 1913–1923 for 13 large operators

PERIOD	FEDERAL TRADE COMMISSION BASIS OF COMPARISON			COAL COMMISSION (OR TREASURY) BASIS OF COMPARISON		
	Margin per gross ton	Rate margin bears to		Margin per gross ton	Rate margin bears to	
		Total f.o.b. mine cost	Sales realization		Total f.o.b. mine cost	Sales realization
		per cent	*per cent*		*per cent*	*per cent*
1913	$0.33	14.3	12.5	$0.18	7.3	6.8
1914	.38	16.6	14.2	.23	9.4	8.6
1915	.31	13.5	11.9	.16	6.6	6.2
1916	.39	15.5	13.4	.24	9.0	8.2
1917	.63	21.9	17.9	.48	1.6	10.8
1918	.41	10.1	9.7	.26	6.6	6.1
1919	.59	12.7	11.3	.44	9.2	8.4
1920	.56	10.3	9.3	.41	7.3	6.8
1921	.80	14.3	12.5	.65	11.3	10.1
1922*	.13*	2.0*	2.1*	.28*	4.3*	4.5*
January–March, 1922	.52	9.4	8.6	.37	6.5	6.1
October–December, 1922	1.19	22.0	18.6	1.04	18.7	15.8
January–March, 1923	1.21	22.2	18.1	1.06	18.9	15.9

* During 1922 there was a strike from April 1, to the middle of September. For the 12 months, as a whole, the average (f.o.b.) mine cost exceeded the average sales realization.

teen companies for which information is available from 1913 to date. Because of the differences in methods in regard to treatment of depletion and depreciation charges followed by the Federal Trade Commission and the Coal Commission, it is necessary to make an adjustment, either by adding 15 cents per ton to the

Coal Commission figures, or by subtracting 15 cents per ton from those of the Federal Trade Commission. In the preceding table are shown the results obtained by following each method, and also the rate per cent that the margins bore to their respective total f. o. b. mine costs and sales realization.

The increase in margin over the pre-war years is in part attributable to Federal income and excess-profits taxes, which are included in the margin and which before 1917 were negligible in amount. The average amount of Federal taxes per ton of all coal produced by the railroad coal companies from 1917 to 1921 was found to be approximately 11 cents. The large margins during the last quarter of 1922 and the first quarter of 1923 were due in part to the active demand and to the favorable prices received for the small sizes, and in part to an increase in the price of domestic sizes announced in September, 1922, after the end of the strike. The increase was made coincident with the decision of the U. S. Supreme Court upholding the constitutionality of the Pennsylvania State tonnage tax.

In general comment on the foregoing table it may be pointed out that the amount of the margin at the end of the ten-year period, by either basis of comparison, is from three to four times what it was in the pre-war years. The increase in the percentage rate which the margin bears to the total f. o. b. mine cost and to the sales realization has been much less marked. This is because the higher labor and supplies costs have made a large increase in the total f. o. b. mine cost, which is the base on which the rate of margin is directly computed and which forms generally from 85 to 90 per cent of the sales realization. In other words, the increases in cost have been met through increased sales realizations. As will be shown later, the actual increase of the investment during this period, through the putting in of new capital, has been relatively small. The increase in the amount of margin thus indicates a substantial increase in profits to the stockholders.

What the margins show—summary. The evidence of the margin as to profits of anthracite operators was summed up by the Commission as follows:

(a) There is normally a wide variation in margins between the low-cost and the high-cost operators. Some operators make very large margins and others very small margins. Still others frequently have to sell below cost.

(b) Present margins are much larger than pre-war, even allowing for Federal taxes. The margin in the six months following the strike was the highest on record, partly because of market conditions which are not expected to be permanent; partly because of an advance in the circular price.

(c) Labor costs and other costs also show a large increase over pre-war figures, but the increase in price has been such that the operators' margin since the war has been about the same percentage of the sales realization as before.

Investment of anthracite operators. The Commission's statement of its attitude towards the conflicting claims as to the basis on which the rate of income should be reckoned is quoted on p. 373. In its report on "Cost of Production of Anthracite" certain aspects of the questions involved were discussed, in so far as they affect the rates of depletion and depreciation charges appearing as elements of the cost of production.

Original investment cost. The "original cost" basis in its simplest form is determined by the amount of money put into the property from time to time by the original owners. In the case of a coal mine it would mean the money actually paid at one time or another for the coal lands and the money actually paid for the improvements, including the underground development of the mine, the surface structures and the equipment. In some cases in addition to the actual money investment made in physical properties there is added a certain amount of money as working capital.[4]

[4] The circumstances surrounding the acquisition of their property and the relatively short length of time that the majority of enterprises in many industries have been in operation are such that the determination of the original cost is often practicable. On the other hand where a concern has been in operation during a long period of years, where it has been formed by amalgamation of previously existing concerns for which payment was made in capital stock or bonds, the market value of which at that time cannot now be determined, or where property of other concerns, or of individuals, has been acquired on other terms not reducible to a monetary basis, it is practically impossible to establish any "original cost" basis of investment. For that reason it is sometimes found expedi-

The Commission was unable to obtain figures of the original investment; neither the records of the present operating companies nor the resources of the Commission were adequate for this purpose. As has been found by the Interstate Commerce Commission in the valuation of the railroads, accurate records of original cost in many instances do not exist. The most that the Coal Commission was able to do was to set down the items of appreciated value which could be identified on the books. It is possible that other appreciations of value, which were not identified as such by the accountants, have been placed on the books even during the life of the present operating companies.

The revaluations made during the period 1913 to 1922 represent for the most part not increments in value since 1913, but readjustments of book values as of March 1 of that year made in pursuance of tax regulations of the Federal Treasury Department. The revaluations made between 1913 and 1921 by the railroad coal companies in table 80 totalled $78,000,000, not including $40,000,000 in certain memorandum accounts of the Pennsylvania and Hillside Companies.[5] In addition to the companies here shown, revaluations to the amount of $15,500,000 were found on the books of the independent companies examined. To this should be added the appreciation of values which took place when the Delaware, Lackawanna and Western Railroad sold its property to the Glen Alden Coal Company in 1921. Assets which at the time of sale showed a value of $6,240,000 on the railroad company's books were entered on the Glen Alden Coal Company's

ent to use, in place of the *actual* original cost, the earliest value that appears on the books and consider that as a practical substitute for "original cost."

[5] The Pennsylvania Hillside Companies carried on their books an average total investment in property used in their coal operations what appears to be an actual original investment, or at least a value established as long ago as 1913, of $7,345,902. That such an amount was far below their actual value at that time is probable from the following considerations. On their books, as memorandum accounts for use in computing depreciation and depletion allowable in connection with the determination of the income tax, the "fair market value as of March 1, 1913" of the fixed assets of these companies was stated as: Value of coal in ground acquired prior

books at $72,240,000, an increase of $66,000,000.[6] The total increase in the book values of the companies examined arising from appreciation of values has thus amounted, since 1913, to approximately $159,800,000, exclusive of $40,000,000 in the memorandum account of the Pennsylvania and Hillside Companies. The total amount of appreciation of values identified both before and since 1913 was approximately $186,000,000, exclusive of $40,000,000 in the memorandum account of the Pennsylvania Coal and Hillside Coal and Iron Companies.

The memorandum accounts of the Pennsylvania and Hillside Companies suggest the increment in value that has accrued to the present or the past owners of the property at some time during its life. It does not follow that the increment has passed entirely into the pockets of the present owners; in the case of these companies we know that it has not. All that it indicates is that property once worth comparatively little has now grown to be worth

to March 1, 1913, $56,193,493; Value of breakers, structures, buildings, shafts, etc., as of March 1, 1913, $9,377,526; or a total value for these fixed assets of $65,571,019, or about nine times the average total investment in all property as actually carried on their books in 1913. Depletion and depreciation charges which reflect such a valuation were used by these companies in making up income tax statements to the Treasury, and cost reports to the Federal Trade Commission and the United States Coal Commission. In their cost reports the companies called specific attention to the fact that the depletion and depreciation charges reported were not carried on their books. The Commission's accountants found that the bases for these reported charges were carried merely as memorandum accounts. There is no reason to doubt that the present market value of the fixed assets of these companies, when the value of their coal lands and their improvements are considered, far exceeds the value shown on their books in their regular investment accounts.

[6] The Commission was aware that the $72,240,000 upon the books of the Glen Alden Company technically represents the original cost to that company, but the stockholders of the coal company were practically identical with those of the railroad company. Little new money was invested at this time and the chief evidence of value was a promise made by the owners in their capacity of stockholders of the coal company to pay $60,000,000 to themselves in their capacity of stockholders of the railroad company. In these circumstances the transaction does not disguise the fact that book values have appreciated without investment of new money.

a great deal more, over and above any reinvestment in the plant out of earnings. Another concrete example of the increase in the value of the original investment is furnished by the Lehigh Coal and Navigation Company.[7]

Those who hold to the theory of original investment as the basis for reckoning profit may, if so disposed, deduct these revaluation items from the book values in order to derive a figure closer to the original cost than the book values themselves. The Commission did not feel justified in making the deduction for several reasons. It was not sure that all the appreciations in value were discovered; the depletion allowances which have occasioned many of these "write-ups" have not yet been finally settled with the Treasury Department and are, therefore, subject to change; the Commission could not guarantee in all instances that the assets revalued are exclusively concerned with the production and sale of coal, though most of them relate to coal lands; and, finally, some of these entries are explained by the companies as restoration to

[7] In the case of the Lehigh Coal and Navigation Company the books showed the original cost of lands acquired in the pioneer days of the anthracite industry. The company has a continuous corporate existence of over one hundred years. Its first operations were on lands leased for an annual rental of one ear of corn. It early acquired some six thousand acres of coal lands at a cost of $30,000. In later years further purchases of 2,940 acres of land were made at a cost of $1,382,000. The total original cost of its present holdings of 8,940 acres of coal lands was $1,412,000. This original cost has been written up by two revaluations. The first, made in 1871, increased the book value by $4,970,000. The second, made in 1917 for Federal tax purposes added $10,060,000 to the value.

In the meantime the depletion charged by the company has amounted to $3,685,000, or two and a half times the original cost of the lands. Yet the lands still stand upon its books at $12,757,000, or nine times their original cost.

The company's business management is conservative and its depletion charge today is the lowest of all the large companies. Few advocates of the theory of original cost will ignore its period of pioneer losses and try to hold down the company to an investment of one ear of corn or even $30,000. On the other hand its history illustrates vividly the increment in values that has accompanied the increased demand and rising price of anthracite.

capital accounts of amounts previously charged off through excessive depletion and depreciation or of improvements charged directly to operating expenses. In view of the accounting practice of some of the companies it is likely that the book values of plant and equipment are in some instances less than the original cost and subsequent improvements. With these uncertainties still attaching to the entries it would have been a departure from the Commission's procedure of strict conformity with the written records of the companies to have made the deductions and calculated the per cent of return on the resulting investment.

Current market value of the anthracite investment. "Current market value" is the value which any given commodity or property will bring if sold in the open market at a specified time. In other words, it is a value established between a willing seller and a willing buyer as of a particular date. There are but few instances where recent sales indicate what might be called a current market value of the anthracite properties.

In many industries the current value of the investment can be determined by considering reproduction cost. In the anthracite industry cost of reproduction might well be reported as a fact with reference to plant and equipment, for it would give a fairly definite figure, but to make such a physical valuation of the mine plants was quite beyond the time and resources available to the Commission. Furthermore, the greater part of the investment claimed by the anthracite companies is in coal-bearing land to which, of course, reproduction costs cannot apply. The capitalization of the earnings over a period of years of a mining company has been sometimes advocated as a method for arriving at a current market value of its investment. This might apply to some concerns, but certainly it would mean little when applied to concerns which, while owning extensive properties, have conducted operations over a series of years which show no earnings, but a loss instead. Undoubtedly the investment in coal lands and plants of such companies has "current market value." Furthermore, while present market value of the land is the nearest approach to reproduction cost, the present market values are not a

basis for estimating the *reasonableness* of present profits. They are themselves but a capitalization of present profits.

Information bearing on current market value of the investment, like that bearing on the original cost, is of value in throwing light on the profitableness of the industry in general. In order to arrive at an estimate of market values, the Coal Commission secured, without compensation, the services of a committee of engineers who, through technical training and many years of experience as experts in the appraisal of coal mining properties, were especially qualified.

The method employed is that adopted by engineering experts in valuation of mining properties; that is, the basis being the present and the estimated future earnings. The objection to the valuation of properties in the anthracite field is that this basis is derived from inherently monopolistic conditions, the uncertainty as to future mining costs and future realizations' margins—the two latter factors highly speculative. Nevertheless, this method of valuation is that which is employed by experts representing capitalists desirous of investing in anthracite mining properties, and is the accepted practice in such transactions involving the value of particular tracts.

The committee's estimate, including both physical property and working capital, also covers the value of lands not owned by operating companies. The valuation is as follows:

Present valuation of lands now operated including development, plant and equipment, and working capital.	$843,500,000
Present valuation of reserve tonnage.....	146,400,000
Total present valuation.....	$989,900,000

Current market value determined on this basis, however, is not a satisfactory base against which to determine whether or not the anthracite companies have extracted unreasonable profits. In the anthracite industry market value depends upon the profits and prices of anthracite for the last 25 years and has been influenced more or less by the operations of what the Supreme Court of the United States has declared to be a combination in restraint of

trade in violation of the commodity clause of the Interstate Commerce Act.

If the estimate of the engineers correctly appraises the present market values of the anthracite industry, it also measures the increment in value to the owners of the land. The book values of the companies examined by the Commission's field accountants after deducting outside investments, amount to $520,000,000, with working capital included (counting the memorandum accounts of the Pennsylvania Coal Company and Hillside Coal and Iron Company as a part of the book value. See p. 381.) The companies examined produced 85 per cent of the output and own in fee 81 per cent of the coal. If they represent a like percentage of the total investment in anthracite mining, the book value would be in the neighborhood of $600,000,000, or $640,000,000 working capital included. In other words, the estimate of the committee indicates a market value some hundreds of millions in excess of the values now on the books of the companies.

The books commonly carry the coal lands at a figure intended to conform with the Treasury ruling, which sets the value as of March 1, 1913, as the proper basis for depletion, and the comparison suggests how large an increment of appreciated value has inured to the owners of the properties even since 1913. The book values in turn are far above the original cost to the present companies.

Book value of investment and rate of return. In the Commission's report on "Investments and Profits in Anthracite Mining," the primary basis of the figures presented was the "Book Value;" that is, the values carried on the books of the anthracite companies as found by field accountants. These values represent in most instances a figure below present market value as estimated by the engineers (see p. 385), but above original cost. Like original costs and market values, the book figures are to be accepted as throwing light on the rate of profit, although not as conclusive evidence.[8]

[8] "Book value" is the value at which any given property is carried on the ledgers or other books of account, excluding, however, any value carried in the form of a "memorandum account." This book value may

The Commission used its own field agents to secure direct from the records of the companies the information on investment and profits. This work involved the examination not only of the regular financial records, such as balance sheets, profit and loss statements, ledgers, etc., but also led to the examination of the minute books of the companies to determine the cause and nature of certain changes which had been made from time to time in the books by direction of the various officials, board of directors, or stockholders' meetings. The first step of the field agents was to ascertain the figures which appeared on the books for the various accounts. After that, in so far as it was possible, an examination was made of the conditions surrounding the entry of certain items. Efforts were always made to get, as far as it was possible from the records available, figures showing the original cost investment or the earliest obtainable figures of investment appearing on the records. The records of all of the "railroad coal companies" were examined, as well as of all of the larger independents, with the exception of the Jeddo-Highland Coal Company ("Markle" interests). Lack of time only prevented

or may not have any relation to actual cost value on the one hand or current market value on the other. The "book value" basis of investment in the case of any long established company will rarely be the same as the original cost. Changes in the market value of the principal assets take place from time to time due in part perhaps to changes in the purchasing power of money, in part to changes in the conditions of supply or demand or accessibility to market. From time to time it may have been found desirable by the officers of the company to increase the figures placed on the books in accordance with the "original cost" basis, by additional amounts designed to bring the "book" investment up to a figure more nearly representing the property's market value at the time the adjustment was made. Such a "write-up" of the investment may be based on the arbitrary judgment of the officers of the company, it may be arrived at by some theoretical basis, it may be the result of a careful appraisal, it may be the basis allowed by the Treasury ruling for computing depletion and depreciation for use in income tax returns, or it may be arrived at by a combination of various methods. As a matter of actual practice, it will be found that for some companies the "book" investment is not far from its current market value; in others, it is below; in others, above.

the examination of the records of this and other "independent" operators.

The combined production from all operators from whom information was gathered formed about 85 per cent of the entire output in 1922.

What the books showed for the railroad coal companies is summarized in the following table. The table includes all but one of the "railroad" coal companies and covers the year 1921, the latest year that may be considered at all normal. The percentage of coal income to total coal investment[9] is the best measure of the profit upon the book values of the companies. For the year 1921 this ranged from 2.1 per cent for the Lehigh Coal and Navigation Company to 30.0 per cent for the Lehigh and Wilkes-Barre, and 45.7 per cent for the Pennsylvania Coal Company and the Hillside Coal and Iron Company (the Pennsylvania Coal Company is not to be confused with the Pennsylvania Railroad). The figures of per cent return on book investments thus show the same characteristic tendency exhibited by the margin—a wide range between the profits of the low cost and the high cost companies.[10]

[9] In the first line of the table are given the total assets for each company as found upon the books, without adjustment. But the figures on the books include both investments in activities not directly connected with the mining and sale of coal and also income from these outside investments. In the following line of the table appears the total investment in coal operations with outside investments eliminated, and below it the total income from coal operations before payment of Federal taxes and dividends.

[10] The high per cent of profit indicated for the Pennsylvania Coal Company and the Hillside Coal and Iron Company in the table requires a word of comment. The book values of these companies contain no revaluation of coal-bearing land such as have been entered since 1913 upon the books of most of the other corporations shown. The figures of these companies, therefore, come much closer to original cost than do those of the others, a fact which accounts in part for the large per cent of profit. That the officials of the Pennsylvania and the Hillside Companies appraise their property at a figure far above the book entries as carried forward for many years is indicated by a memorandum account found by the Commission's agents. This account, kept solely for purposes of reckoning depletion and depreciation in Federal tax returns, placed the value of the coal and equipment, as of 1921, at $45,000,000 instead of the $5,000,000 entered upon the books of the companies. The purpose of the company

TABLE 80

Book figures of coal investment and coal income, and identified revaluations, 1921

	PENNSYLVANIA AND HILLSIDE	LEHIGH VALLEY AND COXE BROTHERS	PHILADELPHIA AND READING COAL AND IRON COMPANY	SCRANTON COAL COMPANY INTERESTS	LEHIGH AND WILKES-BARRE COAL COMPANY	LEHIGH COAL AND NAVIGATION COMPANY	HUDSON COAL COMPANY INTERESTS
Total assets as per books	$26,367,000	$80,656,000	$114,862,000	$5,079,000	$39,266,000	$77,151,000	$85,326,000
Net income as per books	6,126,000	4,012,000	3,482,000	291,000	5,836,000	3,034,000	4,098,000
Total investment in coal operations, adjusted*	13,026,000	46,301,000	97,198,000	4,126,000	28,974,000	31,966,000	51,298,000
Total income from coal operations, adjusted before deducting Federal tax	5,950,000	5,831,000	4,119,000	465,000	8,707,000	678,000	4,496,000
Per cent of return on investment in coal operations	45.7	12.6	4.2	11.3	30.0	2.1	8.8
Revaluations of assets, 1913–1921		38,550,000	12,000		969,000	11,244,000	27,538,000
Revaluations identified prior to 1913		3,500,000	7,000,000†		5,200,000	4,970,000	5,500,000‡

* Average of investment as figured from the companies balance sheets at the beginning and end of the year.

† Approximate.

‡ Minimum.

Increases in net income. The figures of net income confirm the evidence of the margin per ton that the operators have been receiving larger returns since the war than before. In the following table is shown the combined net income from coal operations of all the railroad coal companies except the Glen Alden. From an average of $13,000,000 in the three years 1913-1915 the income rose to $33,000,000 in 1920. In the following year, 1922, as a whole, the income was by far the smallest of the ten-year period.

TABLE 81

Net income from coal operations before deducting Federal taxes, 1913–1922—railroad coal companies

YEAR	NET INCOME
1913	$16,039,000*
1914	11,814,000*
1915	11,264,000*
1916	14,823,000*
1917	29,997,000
1918	22,369,000
1919	25,220,000
1920	33,466,000
1921	30,246,000
1922†	6,249,000

* Total of certain companies' reports for fiscal year and others for calendar year.

† Strike year.

Dividends paid. The following table shows the dividends paid (exclusive of stock dividends) by the railroad coal companies for the years 1913 to date. The very large dividends paid in certain years by the Lehigh and Wilkes-Barre, the Pennsylvania, Hillside and the Lehigh Valley represented in part the distribution of accumulated surplus. Two of the railroad coal companies—the Philadelphia and Reading Coal and Iron Company and the

in keeping accounts in this manner is not clear, but were the $40,000,000 difference between the memorandum account and the book entry added to the present book value of the Pennsylvania and Hillside property, the per cent profit yielded by the coal income would be 11 per cent instead of 45 per cent.

TABLE 82

Dividends paid by nine railroad coal companies, 1913–1922, excluding stock dividends

	PENNSYLVANIA COAL COMPANY		HILLSIDE COAL AND IRON COMPANY		LEHIGH VALLEY COAL COMPANY		COXE BROTHERS AND COMPANY, INC.		PHILADELPHIA AND READING COAL AND IRON COMPANY		SCRANTON COAL COMPANY INTERESTS		LEHIGH AND WILKES-BARRE COAL COMPANY		LEHIGH COAL AND NAVIGATION COMPANY		HUDSON COAL COMPANY INTERESTS	
Total assets, December 31, 1922.	$16,316,864*		$3,283,875*		$68,245,151		$8,154,085		$115,064,815		$4,697,333		$39,127,208		$77,018,864		$42,100,782	
Capital stock, December 31, 1922.	5,000,000		1,000,000		9,465,000		2,910,150		8,000,000		260,000		9,210,000		29,243,400		16,134,250	
Dividends paid	Per cent	Per ton	Per cent	Per ton	Per cent	Per ton	Per cent	Per ton	Per cent	Per ton	Per cent	Per ton	Per cent	Per ton	Per cent	Per ton	Per cent	Per ton
1913	49	$0.44					17	$0.37					13	$0.23	8	†	17	‡
1914	10	.09					9	.21					13	.23	8	†	20	‡
1915	10	.09					15	.32					13	.25	8	†	20	‡
1916	31	.29	25	$0.18			30§	.42					13	.28	8	†	20	‡
1917	110	.92	105	.69	25	$0.32	25	.46					13	.26	8	†	7½	‡
1918	83	.72	45	.29	21	.26	10	.18					13	.27	8	†	7½	‡
1919	54	.52	80	.56	8	.13	9	.16					13	.29	8	†	7½	‡
1920	59	.66	70	.57	134	1.93	92	1.74					13	.31	8	†	7½	‡
1921	137	1.30	205	1.51	72	1.03	83	1.52					227	4.10	8	†	7½	‡
1922	168	2.76	190	6.69	21	.53	20	.72					23	.49	8	†	7	‡

* Memorandum accounts for depletion and depreciation purposes indicate value of $40,000,000 in addition to these amounts.

† Since the larger part of this company's net income is derived from transportation facilities, rate of dividend per ton is omitted.

‡ On account of operating agreements between Hudson Coal Co., Delaware and Hudson Co., Coal Department, and Northern Coal and Iron Co., rate of dividend per ton for the Hudson Coal Co., is omitted.

§ Eighteen months.

Scranton Coal Company—paid no dividends, and the Philadelphia and Reading Coal and Iron Company paid little or no interest on advances previously made to it by the Reading Company, a holding company.

The dividends are shown in two ways: First, in per cent of par value of capital stock; and, second, in dollars and cents per ton of coal produced.[11]

TABLE 83

Increase in accumulated surplus of the railroad coal companies (exclusive of revaluations of assets)

YEAR	SIX COAL COMPANIES PAYING DIVIDENDS	LEHIGH COAL AND NAVIGATION COMPANY*	COMPANIES PAYING NO DIVIDENDS	
			Philadelphia and Reading Coal and Iron Company†	Scranton Coal Company Interests
1912	$9,688,000‡	$1,655,000	$1,460,000	$936,000§
1913	13,295,000‡	1,884,000	2,599,000	911,000§
1914	17,091,000‡	2,390,000	3,315,000	721,000§
1915	24,522,000‡	2,770,000	3,375,000	730,000§
1916	30,028,000‡	3,452,000	6,550,000	537,000§
1917	34,527,000	5,238,000	11,986,000	114,000§
1918	39,107,000	5,712,000	16,146,000	349,000§
1919	53,063,000	6,177,000	19,013,000	44,000§
1920	52,094,000	7,434,000	25,685,000	154,000
1921	37,108,000	8,075,000	29,167,000	460,000
1922	27,245,000	7,467,000	29,074,000	32,000§

* Includes surplus accumulated out of transportation income.

† Company paid little or no interest on advances to it from holding company during this period.

‡ Total of certain companies' reports for fiscal year and others for calenda year.

§ Deficit.

Increase in surplus accounts. Further evidence that the profits of anthracite companies have been increasing is furnished by the increase in their surplus accounts. In table 83 are given the

[11] The very high rates of dividends paid by certain of the companies should be considered in the light of their small capital stock, and in the first two lines of the table the figures of total assets and capital are given for each company for purposes of reference.

earned surplus of the "railroad" coal companies as distinct from surplus arising through revaluation of assets. [12], [13]

[12] The first column of the table shows the surplus of the six railroad coal companies that have been paying dividends in recent years and that are engaged exclusively in the mining and selling of coal. The surplus of these six companies rose from $9,700,000 in 1912 to $53,000,000 in 1919. In 1920 it decreased slightly, chiefly because of the payment by the Lehigh Valley out of its surplus of a dividend of 134 per cent. In 1921 the combined surplus fell to $37,000,000, chiefly because of the payment out of surplus of another dividend of 227 per cent, this time by the Lehigh Wilkes-Barre. Other large dividends were paid during the year, notably $2,050,000 by the Hillside, equivalent to 205 per cent on its small capital stock, and $6,850,000 by the Pennsylvania Coal Company on its capital of $5,000,000.

A further drop in the surplus of these companies occurred in 1922, principally because of the strike, partly because the Pennsylvania and Hillside again paid dividends out of surplus amounting to 168 per cent and 190 per cent, respectively. Yet even after the losses of a five-months strike and the distribution of these considerable sums in dividends, the surplus of the companies stood at $27,000,000 at the close of 1922, or not quite three times what it was at the beginning of the period.

[13] The Lehigh Coal and Navigation Company, though paying regular dividends of 8 per cent, is not shown combined with the other companies because its income is largely derived from transportation. Like the other companies, however, its earned surplus shows a large rising from $1,655,000 in 1912 to $7,467,000 at the end of 1922.

The high-cost Scranton Coal Company paid no dividends during the period between 1912 and 1921, but converted a deficit of $936,000 into a surplus of $460,000. Strike losses during 1922 wiped out the surplus and left the company at the end of the period with a small deficit.

The Philadelphia and Reading Coal and Iron Company cannot be grouped with the other companies, because it not only failed to pay dividends but also paid practically no interest on its heavy indebtedness to the Reading Company, a company which holds its stock. The showing of a surplus under such conditions is a bookkeeping item of uncertain significance. The Commission's accountants did not find that the net earnings of the Philadelphia and Reading Coal Company increased largely during the period, and that the surplus account carried the sums of $1,460,000 in 1912 and $29,074,000 at the end of 1922, an increase of $27,614,000.

The Glen Alden Coal Company, which took over the coal properties of the Delaware, Lackawanna and Western Railroad Company in August 1921, has been omitted from the preceding tables because the change of

Burden of carrying charges on excess reserves of coal land. The greater part of the investment of the anthracite operators consists of coal-bearing land. Where, as is the case of a number of companies, lands are held which cannot be developed at the present rate of output for some generations to come, the carrying charges become a serious burden. The taxes upon the undeveloped lands are charged to operating costs. The interest is not properly chargeable against cost, but it must come out of the margin. Carrying charges on excessive reserves are one reason why some of the substantial companies pay small dividends or no dividends at all.

To ascertain the effect of such charges upon the profits of the companies examined, the Commission retained an expert to estimate the probable life in years at the present rate of output of each of the companies whose accounts were examined. From the information furnished by the companies to the Commission, the expert estimated the total tonnage of recoverable coal in the lands controlled by each company, and divided this by the company's present rate of annual output. The individual estimates are not itemized in the Commission's report. But in order to show the wide range in the amount of reserves carried by the several companies the following table has been prepared, in which there

ownership makes it impossible to set up the accounts on a comparable basis. Were the company included, the profits of the industry would appear larger. Its mine had the lowest average cost of any large operator in the region during the four-year period, 1919-1922. Its margins are, therefore, large and its earnings correspondingly so. For example, in the first quarter of 1923 the average margin of the other railroad coal companies was $ .93 per ton. The margin of the Glen Alden was $1.48. Including the Glen Alden the margin for all the railroad companies was $1.04. In other words, the average with the Glen Alden included was 11 per cent higher than with it excluded.

The Commission was unable to obtain a separation of the coal accounts and the railroad accounts of the Delaware, Lackawanna and Western Railroad Company that would permit a statement of income from coal applied to investment from coal. It is a matter of common knowledge, however, that the business was highly profitable and that the coal mining department contributed largely to the prosperity of the combined enterprise.

TABLE 84

Years life of coal in ground controlled by companies whose books were examined

Figures represent years the coal owned or leased by each operating company or interest will last at present annual rate of output.

COMPANY	LIFE IN YEARS	PER CENT OF COAL IN FEE	PER CENT OF COAL IN LEASEHOLDS
1	480	100.0	0
2	260	86.8	13.2
3	123	100.0	0
4, 5	115	98.0	2.0
6	109	0	100.0
7, 8	98	59.5	40.5
9	70	0	100.0
10	65	81.1	18.9
11	60	4.7	95.3
12, 13, 14	53	94.3	5.7
15	49	81.4	18.6
16	48	50.0	50.0
17 and 17a	39	82.1	17.9
18	32	0	100.0
19	29	40.6	59.4
20, 21, 22	28	5.0	95.0
23	27	0	100.0
24	21	0	100.0
25	19	0	100.0
26	18	100.0	0
27	10	0	100.0
28	10	17.8	82.2
29	8	0	100.0
30	8	0	100.0
31	7	0	100.0
32	Mined out		

appears for each operating interest the life of the property in years at the present rate of output, including all coal, whether

owned or leased, now controlled by the interest. The table also gives the per cent of the tonnage controlled by the corporation in fee and the per cent in leasehold. Company No. 3, for example, has coal enough in the ground to keep on operating for 123 years at the present rate of output, and all of this coal is owned by the operating company. Companies No. 7 and 8 have coal enough for 98 years of operations, of which 59.5 per cent is owned in fee and 40.5 per cent is controlled under lease.

The outstanding example of excess reserves of coal-bearing lands is the Philadelphia and Reading Coal and Iron Company, which owns eighty-five thousand acres of coal lands. According to a semi-official estimate made some years ago, the coal in these lands is sufficient to last for 216 years. The engineering department of the Coal Commission estimates the life of the property at a still higher figure. The taxes on the excess land add to the already high production cost of the Reading and reduce its margin.

Freed from this extra tax burden the margin might be sufficient to pay a modest return if applied to a simple investment in operating properties. Spread over this vast future reserve, the actual margin has paid a very small return.[14]

Had the anthracite business been an ordinary competitive business and the Philadelphia and Reading Coal and Iron Company an ordinary competing business enterprise, one of two things would have happened long ago. The company would either have been

[14]The origin of this condition dates back to 1871, when the prosperous Philadelphia and Reading Railroad undertook to buy up all the available coal lands in the middle and southern anthracite regions in order to prevent its rivals, principally the Pennsylvania and the Lehigh Valley Railroads, from entering its territory and taking away its traffic. In their haste the officers of the road bought at what were then high prices, a vast speculative reserve of coal lands. They made the purchases through a mining company organized expressly for the purpose and called the Philadelphia & Reading Coal and Iron Company. To finance the enterprise they borrowed about $40,000,000 and advanced it to the mining company. The mining company has since been run as an adjunct to the railroad. Its function has been to provide traffic. Most of the time it has been quite unable to pay the railroad more than nominal interest on the sums advanced to it.

forced out of business *or else forced to sell part of its coal lands to some one else.*

The thing that saved the Reading Coal and Iron Company was the absence of effective competition, due to the peculiar economic organization of the anthracite industry. Through a holding company, the Reading Company, a single interest was mining, selling and transporting the coal. The Philadelphia and Reading *Railway* was highly profitable; it regularly paid into the treasury of the holding company dividends of 10, 15 and 20 per cent. "The investors received from the railroad operations enough to make up for their losses in coal mining and to meet the carrying charges on the speculative reserve of coal lands, and still draw since 1913 regular dividends of 8 per cent on common stock.

"Of late the business of the mining company has become more profitable. Since 1913 it has paid no interest, but has allowed its earnings to accumulate in surplus account which now amounts to $29,000,000. In 1920, the coal company earned net income, before deducting Federal taxes, of $6,844,000; its average yearly earnings for the five years 1917-1921, were $4,800,000. This would appear to be enough to yield a modest income on that part of the

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These ill-advised purchases of land were one cause, though not the only cause, that three times drove the Philadelphia and Reading Railroad into bankruptcy. In the last receivership (1896) a change in organization was effected and a holding company known as the Reading Company was created which, until December 31, 1922 (the end of the period covered by this report) owned the stock of both the Philadelphia and Reading Railway Company and the Philadelphia and Reading Coal and Iron Company. During the first half of 1923 a plan for the segregation of the railroad and coal properties was approved by the courts.

During these receiverships the values of the land were written up $20,000,000 to wipe out deficits. Since then there have been "write-downs" so that the book values of the coal lands are today written up only about $7,000,000 and are now about $40,000,000.

The Coal Company owes the holding company, according to the accounts, the sum of $69,000,000. The holding company has carried this by borrowing at 4 per cent on a general mortgage, for which the property of the coal company is pledged as part security.

The Philadelphia and Reading Coal and Iron Company has never paid a dividend. It has never paid more than 1, 2 or 3 per cent a year interest

investment of the Coal Company that may in any proper sense be considered as devoted to the business of mining and selling coal. * * *

"The Supreme Court of the United States has declared this combination of the Railroad and Coal Companies to be in violation of law and has ordered a dissolution. * * *

"The Commission insists that the dissolution ought not to be made the occasion for further increases in the price of coal. The coal company has been operating under an agreement by which the railroad paid the carrying charges on the excess coal lands. If this arrangement is illegal, the excess reserve should be taken care of by some other means than through an advance in the price. The American people do not want their coal at prices that will not yield a fair profit, but they do not believe that it is an inherent right of any corporation to embark on a 200-year speculation in land and ask the public to pay the cost of carrying it, out of the present price of coal."

Summary and conclusions. The wide differences in accounting methods followed by the operators makes the collection of adequate figures of cost, investment, income and profits a matter of great difficulty. It places excessive burdens both on the operators and the agency which collects and compiles the information. The unavoidable delay in getting and making it available for use is often very costly to the public interest, where such information is needed to avert a crisis. Many of these difficulties and delays

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on the Reading Company loan of $69,000,000, although the money which is carrying the loan is borrowed at 4 per cent. In the years before the war, the coal company was earning 1 or 2 per cent on its book values, and the Reading Company was remitting the unpaid interest, and year by year forgiving a part of the principal.

At first sight it would appear that the Philadelphia and Reading Coal and Iron Company has been extremely unprofitable. Its production costs has indeed been high. Its mines are located in the steeply pitching beds of the western Middle Field, where costs are high, and the Southern Field, where they are still higher. Other companies in these fields, however, have managed to get along. The peculiar difficulty of the Reading has apparently been to pay the taxes and interest in its enormous reserve of coal lands.

would be avoided if the Federal Government or the State of Pennsylvania should establish a prescribed system of accounting, compulsory on all operators in the industry. Such a system should be carefully designed to secure sufficient and comparable information, while being at the same time flexible enough to take care of the widely different conditions of the various operators.

If adequate information on income, costs, investments and profits is to be collected regularly from anthracite operators by any Governmental agency, it will first be necessary to establish an adequate system of accounting.

In the conclusion to its report the Commission made the following specific recommendations for the attention of the industry, the State and the Federal Government:

> In order to permit the public as a whole to share in the good fortune of the low-cost, high-profit operator, we recommend that differential taxation shall be applied to differential advantage. Sweeping horizontal cuts cannot be made in present mine prices and margins without serious injury to many high-cost operators, whose output is needed. Taxes falling lightly on the low-profit operator and more heavily on the high-profit operator in proportion to his ability to pay will benefit the consumer indirectly through lightening the tax burden elsewhere and will accomplish this without raising prices.
>
> To protect the public against unjustified increases in price, we recommend complete publicity of accounts through a Federal agency with power to compel reports, and to prescribe the form of accounts.
>
> Because of the large increase in operators' margins per ton since the strike of 1922, and the possibility of further increase in prices as a result of the recent settlement (1923), we believe that such current publicity as to costs, margins and profits should begin at once. Unless the public is protected by publicity of accounts, we are apprehensive that the concentrated control of the industry may take indefensible profits.
>
> The consumer has in his own hands a measure of protection against unreasonable profits. We recommend to consumers the use of substitute fuels.

PART III—RECOMMENDATIONS

CHAPTER XV

What the Commission Recommended

After considering the mass of basic information which has been summarized in the preceding chapters, the Commission declared:

> The fundamental evil in the anthracite industry is that of monopoly—the treatment of limited natural resources as if they were like other private property. Reliance on competition without supervision has resulted in persistence of a permanent level of high prices above which extortionate increases were made whenever a suspension of mining or other disturbances gave rise to the phenomenon of premium coal. In the anthracite industry we have secured stability—which is desirable—but it has been at high cost to the consumer and has made anthracite a luxury fuel. . . .
>
> The mining and marketing of soft coal is the larger and, from the point of view of the national economic life, the more important industry, and here the fundamental evil is overdevelopment, irregularity of operation and consequent enforced idleness of miners and of invested capital. This problem, like that of anthracite, can be solved only by the Federal Government, in co-operation with the industry, working on a national scale and with a clearly defined national policy.[1]

The Commission, it should be remembered, was a creature of Congress, and the Act authorizing its appointment required it to report to the President and to Congress facts and recommendations "which would be deemed helpful in determining and establishing a wise and efficient policy by the Government relative to said industry."

The recommendations as to legislation, then, are of primary importance. They represent the Commission's answer to Congress as to the initiation by the Government of "a wise and efficient policy" for dealing with coal. But they are only a part and, perhaps, not the most important part of the recommendations.

1. Government Action: Federal, State and Local

(1) The Commission recommended to Congress and the President: Continuous fact-finding, publicity and regulation of

[1] U. S. Coal Commission, Final Report (Mimeographed Report S), p. 7.

the coal industry, both bituminous and anthracite, through use of the powers of the Federal Government over interstate commerce. Like the railroads, the coal industry should report to a public authority, and the Commission insisted that the public interest places limitations on the rights of owners of coal lands, operators, mine-workers, carriers and dealers.

(2) As the administrative agency through which these powers should be exercised it recommended the creation of a coal division in the Interstate Commerce Commission. The proposed coal division should correct abuses, collect information and act in emergencies as Federal Fuel Distributor.

(3) The Commission recommended Federal licensing of those who buy or ship coal in interstate commerce.

(4) It recommended a Federal tax on royalties and differential profits.

(5) It recommended the adoption of a standard uniform ton. At present, of course, both the long ton of 2,240 pounds and the short ton of 2,000 pounds are in use.

(6) The Commission further recommended that the Interstate Commerce Commission re-examine differential railway freight rates with a view to (a) the promotion of coal movement by water, (b) the discouragement of the long haul by rail.

(7) It recommended modification of the rules governing distribution of railroad cars in periods of shortage so as to give consideration to the commercial ability of the producer to sell coal rather than to mere ability to produce and load it into cars.

(8) It recommended that contract coal be given precedence over spot coal deliveries.

(9) It recommended that the Government, as administrator of fifty million acres of coal lands, amend the leasing laws so as to restrict the opening of new bituminous mines.

(10) It recommended a Division of Community Sanitation in the Bureau of Mines or a similar division in the Public Health Service.

(11) It recommended that "Congress designate an agency to unite with the industry in continuing studies of unemployment" and "of the wage structure;" this agency serving as the medium

of publicity for wage rate information and being prepared to make special compulsory investigations whenever there is a threat of failure to renew a wage agreement.

(12) Continuous investigation and publicity as to labor relations with the possible resort to mediation at the instance of the President of the United States was recommended.

(13) Nationalization of the mines was not recommended.

(14) Compulsory arbitration was not recommended.

(15) Compulsory incorporation of the union was not recommended.

(16) Price-fixing by the Government was not recommended.

(17) The Commission recommended the consolidation, grouping or pooling of bituminous mining operations, under such restrictions as are prescribed for railroads in the Transportation Act.

(18) The Commission recommended that the State and Federal Governments co-operate in inspection, revision of mining codes, supervision of compensation insurance and safety education. It pointed out that the mining codes of some States are badly in need of revision.

(19) It recommended that communities license retail coal dealers, organize co-operative associations, open municipal fuel yards or, in other ways, as they may see fit, deal with the problem of local distribution of coal.

2. ACTION BY OPERATORS AND UNITED MINE WORKERS

The recommendations of the Commission as to "a wise and efficient policy by the Government" were not by any means all that it had to offer. Indeed, in the opinion of the commissioners, the recommendations to the industry were of equal if not of greater importance than those to the Government:

> Existing organizations in the industry—of operators, miners and dealers—furnish the natural point of departure for the reforms and improvements that are essential.

(20) To the industry the Commission recommended a number of improvements in management methods: The development and

efficient application of mechanical devices to replace hand loading; better control and co-ordination of underground operations, particularly cutting, loading and haulage; standardization and co-ordination of the work of the individual mine-worker; standardization of details of construction and dimensions of mine-cars, locomotives, track and all other equipment; and multiple shifting of work in the mines and preparation plants.

(21) The Commission called special attention to the British wage plan as a method for furthering the common interest of miners and operators in continuous operation; a plan which provides that miners and owners share the profits of the business in defined proportions.

(22) Betterment of living conditions was also emphasized as a field for co-operative effort of miners and operators.

(23) Organized effort by both parties was recommended in studying the problem of unemployment; the wage-rate structure and its relation to the different jobs in the mines; and the perfection of machinery for settling disputes through conciliation.

(24) Voluntary arbitration was stressed.

(25) A joint system of unemployment compensation or insurance was recommended.

(26) To the operators obvious improvements in personnel management, training of foremen, centralized responsibility for labor relations and more effective organization of operators to deal with labor relations, including the appointment of district and national labor commissioners to work out a national labor policy, were recommended.

(27) Collective bargaining to work out a system of national negotiation with district agreements was recommended.

(28) The check-off was not recommended.

(29) Complete unionization was not recommended.

3. INDIVIDUAL ACTION

(30) Consumers, large and small, were urged to buy for regular delivery on contract and to store coal. Thrift in the use of coal was recommended, as well as wider use of technical information relative to fuel economy.

(31) The wider use of substitutes for anthracite was recommended.

Basic principles. The more important recommendations of the Commission rest on two fundamental principles: (1) Coal is clothed with a public interest; (2) the production and transportation of coal constitute a single service, since coal is not mined until the railroad car for its transportation is at the mine. Coal is thus more than a commodity—it is a service.

The type of Government regulation which was recommended rests on this basic proposition.

The second proposition is that the industry can reform itself.

A Coal Division in the Interstate Commerce Commission. The Coal Commission, as I have indicated, proposed the creation of a new division in an existing Governmental agency. The proposal also emphasized the fact that the key to coal is transportation.

Under the proposed plan the Geological Survey will continue to classify and value the public coal lands, and to compile figures on coal production, consumption and commercial stocks on hand. The Bureau of Mines will continue its investigations in mining technology, mining safety, fuel economy, quality of coal and the administration of Government leases. The Bureau of the Census will continue its work in the biennial Census of Manufactures and the General Census of population, while the Public Health Service will investigate sanitary conditions.

Information on costs, sales realization, margins of profit, wage rates, earnings of miners and a wide range of economic and engineering facts of the sort which the United States Coal Commission had collected, the Coal Division in the Interstate Commerce Commission will be empowered to collect and to publish. It will be empowered to secure data from other Government bureaus. Finally, it will act in emergencies as Federal Fuel Administrator, subject to the direction of the President.

Some aspects of regulation. The Commission defined the function of the Government as that of supervision, with substantial powers of regulation, and added:

> This may be regarded as the characteristically American and constitutional method of dealing with such a national problem as is now presented in the coal industry.[2]

[2] U. S. Coal Commission, Final Report, p. 5.

The Commission's proposals were intended to increase rather than to decrease the sense of responsibility within the industry.

Extraordinary emphasis was laid on the value to the industry of such investigations as the Commission had pursued, and of such as the miners, the operators and certain other bodies have made either in supplementing the Commission's investigations or in duplicating them.

Complete publicity through a Federal agency with power to compel reports and to prescribe their form was the basic recommendation in this section.

The Commission also recommended the levy of a graded tax on royalties and differential profits. It pointed out that this will not lower the price of coal to the consumer, but that it will secure a public revenue without increasing the price of coal.

> Taxes falling lightly on the low-profit operator and more heavily on the high-profit operator in proportion to his ability to pay will benefit the consumer indirectly through lightening the tax burden elsewhere.[3]

An excess profits tax would not be added to the price of coal, and thus would not be levied on the consumer, as it would fall only on those operators who have differential advantages. Limitation of margins to a reasonable return on legitimate investment and elimination of monopoly profits, whether found in the form of royalties, of operators' and dealers' margins, and of freight rates, was recommended.

In the case of bituminous coal, the recommended regulation is primarily based on the granting and withholding of transportation service.

Finally, the most convenient and practicable method of exercising regulatory powers through a Coal Division in the Interstate Commerce Commission appeared to the United States Coal Commission to be the licensing of all who ship coal from one State to another or who buy and sell in interstate commerce, whether as operators, wholesalers or jobbers. Necessarily, there

[3] U. S. Coal Commission, Report on Investments and Profits in Anthracite Mining (Mimeographed Report P), p. 17.

would be certain conditions attached to the granting of a license, and violation of these conditions would be cause for suspension or revocation.

A national labor policy. The Commission proposed that Congress designate an agency to unite with the industry in continuing studies of unemployment, as an effect on irregular operation, and studies of the wage structure, serving as a medium of publicity for wage rate information in the non-union fields as well as of other basic facts on which industrial relations depend. This means continuous investigation, bringing about such an exchange of information with management as will stimulate improving practice, and making the union constantly more heedful of its public responsibilities.

Continuing investigation would be accompanied by timely and discriminating publicity. Progress in the improvement of management, and the effectiveness of agencies which management might employ to bring about better labor relationships would need to be reported, as well as the workings of the adjustment machinery, and the progress of the union in maintaining discipline and in meeting responsibilities under agreements.

The Commission recommended that all agreements between operators and union contain a clause which would provide for their automatic renewal, except as to such provision as one party or the other may have given 90 days' notice in advance of the date of terminating the agreement. In case of a failure to agree, a report to the President should be made not later than 60 days before the expiration of the agreement; and if with such continuous investigation and publicity a disagreement should still be carried to the point of threatening a stoppage of work, the Commission then recommended that a special report be made to the President of the United States, who shall designate a person or persons to inquire into the situation and to make to him a special report and award on or before the date of expiration of the agreement. The Commission pointed out that the award could be made public or not, as the President would deem wise.

The British wage plan. At least one of the important recom-

mendations is apt to attract too little attention. It is the recommendation to the industry relative to the British Wage Plan. The Commission said:

> Part-time operation which causes increased costs to the operators . . . at the same time cuts in half the miners' earnings. This common interest in continuous and successful operation finds a concrete expression in the present British wage agreement, which provides that miners and owners share the profits of the business in defined proportions, the profits being figured not on a single mine, but on the whole district.[4]

The British wage agreement provides for audits of the operators' books and profit sharing. From the aggregate bill of wages of the district is deduced a standard wage which represents the rates in July, 1914, with certain increases. Seventeen per cent of the amount of the standard wages constitutes the standard profits of the owners, and after deducting the standard wages, the standard profits and the costs of production other than wages from the gross proceeds of the district, the surplus is divided in the proportion of 83 per cent to wages and 17 per cent to profits. The standard wages and the share of the surplus apportioned to wages give a percentage of the basic rates which constitute the rate of wages payable during the next pay period.

If in any period the proceeds have been insufficient to meet the standard profits, the deficiency is carried forward as a first charge against any surplus in subsequent periods.

Coal contracts and coal storage. Emphasis was laid on the necessity of making binding contracts, so that every tonnage contract is recognized as a fixed obligation on the part of the seller to ship and the buyer to accept the coal called for in the contract unless prevented by causes definitely stated in the contract and beyond the control of the parties.

The Commission found that consumers of coal, large and small, are responsible to no small degree for the bad functioning of the industry. Peak demand for coal involves a peak demand for coal transportation, and this cannot be met except by an expansion of rail equipment and facilities.

[4] U. S. Coal Commission, Final Report, op. cit., p. 11.

Regular, systematic, large-scale storage of bituminous coal by consumers during the seasons of low consumption is the public's largest opportunity and responsibility in solving the coal problem.[5]

To this vital subject the American Engineering Council (Federated American Engineering Societies) has given attention, and a comprehensive report, utilizing the findings of the Coal Commission has been published exhaustively treating the chemical, engineering and economic problems involved in large-scale coal storage.[6]

Conclusion. In treating the Commission's recommendations the unity rather than the diversity of the aspects of the coal problem has been stressed. The basic contrasts between the anthracite and bituminous industries, of course, are large, and the Congress took account of that fact in requiring of the Coal Commission a separate report on anthracite. The Commission was continually and duly impressed with the variety of conditions, not simply as between the hard and the soft coal industries, but as between the widely scattered and multifarious forms in which soft coal is found and exploited.

But there is unity as well as variety in the problem of coal, and any change in public policy toward this problem should be a united and consistent change. Such a change can be brought about only by persistent thought and unified effort. A national service of heat and power is already necessary. It is ultimately inevitable. It will be developed, wisely or unwisely. The public will participate. It is only the degree of its participation that is in doubt.

That is not to say that the coal problem will be solved in a month or a year, or even in several years.

Guided by facts rather than rumors, by information rather than prejudice, the people will be able to exercise wisely the powers of the Government over this type of private business.[7]

---

[5] U. S. Coal Commission, Report on Coal Storage (Mimeographed Report K), p. 2.

[6] See Industrial Coal—Purchase, Delivery and Storage, New York, 1924.

[7] U. S. Coal Commission, Final Report, op. cit., p. 4.

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